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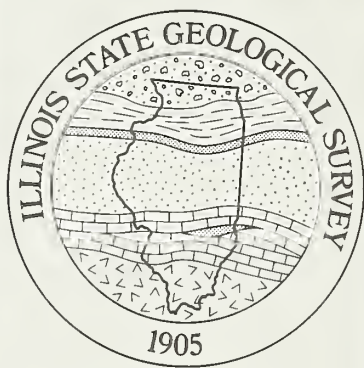
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ILLINOIS STATE GEOLOGICAL SURVEY ANNUAL REPORT

July 1989-June 1990

Recognition and Service




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HONORS AND AWARDS

Prizes, Medals, High Offices, and Other Honors

Robert A. Bauer and Beverly L. Herzog were co-recipients of the ISGS Distinguished Achievement Award on October 24, 1989. In presenting the award to Robert Bauer, the Chief cited the national and international recognition he received for his research on the applications of geology to tunneling and mine subsidence and his major contributions to the success of the Geological Survey's programs of geotechnical studies for the site proposal for the SSC and the Illinois Mine Subsidence Research Program. In presenting the award to Beverly Herzog, the Chief noted the national recognition she received for her studies of groundwater geology applied to groundwater monitoring, her being credentialed as 1 of only 250 Certified Groundwater Professionals, her being named an Outstanding Young Woman of America by the Outstanding Americans organization, and her achievements as acting head of the Groundwater Resources Section during the prolonged illness and convalescence of **Paul R. Seaber**.

Keros Cartwright was awarded a Certificate of Leadership by the International Biographical Centre, Cambridge, England.

William G. Dixon, Jr., was awarded a Certificate of Appreciation by the Association of Engineering Geologists for his service as editor of *AEG News*. The award was presented at the Association's annual meeting in Vail, Colorado, October 4, 1989, by President Christopher Mathewson.

Gary B. Dreher received a citation signed by Chancellor Morton Weir, Chief Morris W. Leighton, and other officials recognizing him as an "outstanding volunteer, for his significant contributions to the Campus Charitable Fund Drive."

J. James Eldel was elected to the Foundation of the Society of Exploration Geologists.

Donald A. Keefer was elected to membership in Gamma Sigma Delta, the student honor society for agriculture.

Janis D. Treworgy, Michael L. Sargent, Dennis R. Kolata, and Sandra K. Stecyk received the Vincent E. Nelson Award for the best poster at the annual meeting of the Eastern Section of the American Association of Petroleum Geologists, September 11-13, 1989, at Bloomington, Indiana.

Allson B. Lecourls and Nicholas P. Schnelder were recognized as Outstanding New Staff Members by the Illinois State Geological Survey at the Retirement and Recognition Party, October 23, 1989. The citations noted their "noteworthy contributions to our research and service programs...and their prospects for future success."

Morris W. Leighton was named as AAPG Distinguished Lecturer this past year.

E. Donald McKay, Lisa R. Smith, Robert R. Pool, Gail D. Taylor, Sally Denhart, Robert J. Krumm, and Barbara J. Stiff received First Place Awards in the categories of Most Analytic Poster and Most Communicative Poster, and Second Place Awards in the Categories of Most Attractive Poster and Most Unusual Poster for the display, "Unraveling Complex Geologic Settings Using GIS," at the Tenth Annual International ARC/INFO Users Conference in Palm Springs, California, May 14-18, 1990. The selections were made by the conference participants from among approximately 250 poster displays at the conference.

Donald F. Oltz was awarded a certificate of appreciation by the Illinois Oil and Gas Association at their annual meeting in Evansville for his work on behalf of the independent producers in the Basin.

The **Illinois Mine Subsidence Research Program** won an Environmental Achievement Award from the National Environment Awards Council. The program underwent a rigorous verification process and is listed in the 1990 Environment Success Index.

Graduate Degrees Earned by Staff Members

Terrie P. Adams earned the degree of Master of Science in Geology from the University of Illinois at Urbana-Champaign in May 1989.

Wayne T. Frankie earned the degree of Master of Science in Geology from the University of Kentucky at Lexington in March 1990.

James R. Gastlineau earned the degree of Master of Science in Environmental Studies (Science Option) from Southern Illinois University at Edwardsville in June 1990.

Timothy H. Larson was awarded the degree of Doctor of Philosophy in Geology by the Department of Geology, University of Illinois at Urbana-Champaign.

SCIENTIFIC AND EDUCATIONAL CONTRIBUTIONS

Papers/Abstracts Presented at Scientific Meetings

H. Wayne Bang presented the paper, "Flow Unit Modeling and Application to Reservoir Simulation, Zeigler Field, Illinois," at the annual meeting of the Illinois Oil and Gas Association in Evansville, Indiana, March 1990.

Rita M. Bauer presented the paper, "Fluid Inclusion Studies of Regionally Extensive Epigenetic Dolomites, Bonneterre Dolomite, Southeast Missouri: Evidence of Multiple Fluids During Lead-Zinc Ore Mineralization," at the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1989.

Robert A. Bauer presented the paper, "Rock Strength and Overburden Changes due to Subsidence over a Longwall Coal Mining Operation in Illinois," at the 31st U.S. Symposium on Rock Mechanics at Golden, Colorado, June 18-20, 1990. Co-authors were **David Brutcher**, **Brenda Bouché Mehnert**, and **Dan J. Van Rosendaal**.

James W. Baxter read the paper, "Factors Determining the Economic Feasibility of Reprocessing Coal Beneficiation Wastes," at the Biohydrometallurgy '89 conference in Johnson, Wyoming, August 13-18, 1989. He presented the paper for the principal author, **Subhash B. Bhagwat**, who was unable to attend due to a schedule conflict.

Richard B. Berg, visiting scientist from the Montana Bureau of Mines and Geology, Butte, Montana, presented the paper, "Formation of Tripoli (Microcrystalline Silica) Deposits in Southern Illinois," at the annual meeting of the North Central Section, Geological Society of America in Macomb, April 26-27, 1990. Traveling to the meeting, he visited a limestone mine and a cement plant on April 25.

Kristl K. Brewer presented the paper, "Carbon Monoxide-Ethanol Desulfurization of Coal," at the National Corn Grower's Association Corn Utilization Conference III at St. Louis, Missouri, June 19, 1990.

Richard A. Cahill presented the paper, "Overview of the Significance of Radon in Natural Gas," at the Gas Quality and Energy Measurements Conference sponsored by the Institute of Gas Technology at Rosemont, Illinois, June 12-13, 1989, and the paper, "Overview of the Significance of Radon in Natural Gas: An Update," at the Gas Quality and Energy Measurements Conference in Chicago, Illinois, July 16-18, 1990.

Chen-Lin Chou presented the paper, "Chlorine Removal from Coal by Wet-Grinding and Leaching Processes," at the Illinois Coal Development Board's Seventh Annual Contractors' Technical Meeting, Urbana, Illinois, August 1-3, 1989. At the International Conference on Trace Elements in Coal held at Barren River, Kentucky, September 11-13, 1989, he presented, "Abundances and Geochemical Significance of Rare Earth Elements in Coal." At the First International Conference on Chlorine in Coal at Chicago, Illinois, October 9-11, 1989, he presented, "Distribution and Forms of Chlorine in Illinois

Basin Coals." He was one of the organizers of this meeting and chaired the first technical session of the meeting, Chlorine in Coal: Characterization and Measurement.

Melissa Chou presented the paper, "Characterization of Aromatic Hydrocarbons from Oil Shale Extracts by Tandem Mass Spectrometry," at the annual meeting of the Federation of Analytical Chemistry and Spectroscopy Societies in Chicago, Illinois, October 1-6, 1989.

Michael J. Chrzastowski presented the paper, "Sidescan Sonar Examination of Deteriorated Revetments and Bulkheads Along Chicago's Lakefront," at Coastal Zone '89, the Sixth Symposium on Coastal and Ocean Management, held July 11-14, 1989, at Charleston, South Carolina. At the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1989, he presented the invited paper, "Coastal Stratigraphic Models and Paleogeographic Reconstruction of Delaware Archaeological Sites, Atlantic Continental Margin," for the Archaeology Division Symposium on Geological Controls on the Regional Distribution of Archaeological Sites. At the annual meeting of the North Central Section of the Geological Society of America in Macomb, Illinois, April 26-27, 1990, he presented the paper, Monitoring of 1988-89 Beach and Nearshore Changes at North Point Marina, Winthrop Harbor, Illinois. He also co-chaired the geomorphology theme session for the meeting. He presented "Key Aspects of Illinois Coastal Erosion Problems" for the Great Lakes Shoreland Management Workshop at Cleveland, Ohio, June 21-23, 1990.

Dennis D. Coleman presented the invited paper, "The Use of Isotopic Analysis for Identification of Landfill Gas in the Subsurface," at the Thirteenth International Landfill Gas Symposium of the Governmental Refuse Collection and Disposal Association held at Lincolnshire, Illinois, March 27-29, 1990. He also presented the invited lecture, "Distinguishing Gases from Different Sources Using Chemical and Isotopic Analysis," for the Society of Petroleum Engineers Aquifer Storage Section meeting at Pontiac, Illinois, March 14, 1990.

Joan E. Crockett and Donald F. Oltz co-presented the poster, "Preliminary Assessment of Hydrocarbon Potential in Southern Illinois," at the annual meeting of the Eastern Section of the American Association of Petroleum Geologists at Bloomington, Indiana, September 11-12, 1989.

B. Brandon Curry presented the paper, "Fossiliferous Farmdalian and Woodfordian Sediments at Lomax, Illinois," at the annual meeting of the North Central Section, Geological Society of America, Macomb, Illinois, April 26-27, 1990.

Heinz H. Damberger and Colln G. Treworgy co-presented the poster paper, "Springfield Coal (Pennsylvanian) of the Illinois Basin: A Preliminary Report on a Cooperative Project," at the annual meeting of the Eastern Section of the American Association of Petroleum Geologists at Bloomington, Indiana, September 11-12, 1989. They also presented the poster paper, "Geology of the Springfield Coal Member (Bed) (Pennsylvanian) of the Illinois Basin in Illinois, Indiana, and Kentucky," at the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1989.

Joseph A. DeBarr presented the paper, "Combustion Studies of Coal-Derived Solid Fuels by Thermogravimetric Analysis: 3. Correlation Between Burnout Temperature and Carbon Combustion Efficiency," at the Eighteenth Annual North American Thermal Analysis Society Conference in San Diego, California, September 24-27, 1989.

Philip J. DeMaris presented the paper, "Paleoecology of Early Herrin Swamp Development Within a Small Paleochannel, Christian County, Illinois," at the annual meeting of the North Central Section, Geological Society of America, Macomb, Illinois, April 26-27, 1990.

Ilham Demir presented the paper, "Variation of Organic Sulfur in Macerals of Selected Illinois Basin Coals," at the Sixth Annual Meeting of the Society for Organic Petrology at Urbana, Illinois, October 29-31, 1989. At the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1989, he presented, "Distribution of Organic Sulfur in Macerals of Selected Illinois Basin Coals."

Gary B. Dreher presented the paper, "Factors Affecting the Management of Fine-Coal Cleaning Waste Solids," at the Seventh Annual Contractors' Technical Meeting of the Illinois Coal Development Board sponsored by the Center for Research on Sulfur in Coal at Urbana, Illinois, August 1-3, 1989.

Henry P. Ehrlinger and Poo Chow co-presented the paper, "Particle Size Enlargement of Fine Coal or Char Using Lignocellulosic Waste from TVA's Biomass Program," at the Seventh Annual Contractor's Technical Meeting of the Illinois Coal Development Board sponsored by the Center for Research on Sulfur in Coal at Urbana, Illinois, August 1-3, 1989.

J. James Eldel presented the paper, "Earth Science for Everyone—A Requirement to Solve Earth's Growing Problems," at the annual meeting of the North Central Section, Geological Society of America, Macomb, Illinois, April 26-27, 1990.

Anne L. Erdmann presented the paper, "Surficial Deposit Thickness Maps Using the TIN Module of ARC/INFO: A Computational Method," at the Third Annual Midwest/Great Lakes ARC/INFO Users Conference at Madison, Wisconsin, October 17-19, 1989.

Leon R. Follmer attended the Twenty-eighth International Geological Congress in Washington, DC, July 9-19, 1989, where he presented the paper, "Current Loess Research and Correlation Problems Along the Mississippi River Valley from Illinois to Louisiana."

Wayne T. Frankie presented the paper, "Geologic Controls on the Thickness, Lithology and Hydrocarbon Potential of the "Big Lime" (Mississippian) Carbonate Sequence in Southeast Kentucky," at the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1989, and at the annual meeting of the Kentucky Oil and Gas Association at Louisville, Kentucky, May 16-18, 1990. He was a co-chair of the petroleum geology session at the GSA meeting.

Joyce K. Frost presented the poster session, "Determination of Elemental Concentrations in Nine CMEA Rock and Ore Standards, in Fired Clay Gent (FCG) and in NBS 98 Plastic Clay by Neutron Activation Analysis," at the International Conference on the Chemical Analysis of Geologic Materials, Huntsville, Ontario, June 3-8, 1990.

Ardith K. Hansel presented the paper, "New ^{14}C Ages on Late Holocene Peat Accumulations in Beach-Ridge Swales at Illinois Beach State Park," at the Second Annual Southern Lake Michigan Shore Erosion Workshop sponsored by the U.S. Geological Survey at St. Petersburg, Florida, February 6, 1990.

Richard D. Harvey presented the paper, "Spatial Distribution of Organic Sulfur in Selected Illinois Basin Coals," at the Seventh Annual Contractors' Technical Meeting of the Illinois Coal Development Board, sponsored by the Center for Research on Sulfur in Coal at Urbana, Illinois, August 1-3, 1989.

Beverly L. Herzog attended the Second National Symposium on Water Quality in Orlando, Florida, November 12-17, 1989, where she presented the poster paper, "Volatile Organic Compound Variability During Well Purging."

James R. Jennings presented the paper, "Erosion History of a Beach-Ridge and Dune Plain on the Illinois Lake Michigan Shore," at the Thirty-third Conference of the International Association for Great Lakes Research at Windsor, Ontario, May 13-17, 1990, and the Delineation of Erosion Hazard Shorelands workshop sponsored by the International Joint Commission at Cleveland, Ohio, June 21-23, 1990.

Latif A. Khan presented the paper, "Microcomputer Interfacing with Sensors in Comminution Research," at the 1990 Symposium on Surface Mining at Knoxville, Tennessee, May 1990.

Myrna M. Killey, Robert J. Krumm, and C. Brian Trask co-presented the paper, "Screening for a Landfill in Champaign County, Illinois: New Techniques for Mapping Complex Glacial Deposits Using

a Geographic Information System (GIS)," at the annual meeting of the North Central Section, Geological Society of America at Macomb, Illinois, April 26-27, 1990.

Dennis R. Koiata, Michael L. Sargent, and Janis D. Treworgy co-presented the poster paper, "Tectonic Subsidence History of the Illinois Basin," at the annual meeting of the Eastern Section, American Association of Petroleum Geologists at Bloomington, Indiana, September 10-13, 1989. At the annual meeting of the North Central Section of the Geological Society of America at Macomb, Illinois, April 26-27, 1990, they presented the poster paper, "*Subsidence History of the Illinois Basin.*"

Ivan G. Krapac presented the paper, "Hydraulic Properties of an Experimental Soil Liner: Preliminary Results," at the Twelfth Annual Madison Waste Conference, Madison, Wisconsin, September 20-21, 1989, and at the annual fall meeting of the Illinois Groundwater Association in Champaign, October 26, 1990. At the Sixteenth Annual Hazardous Waste Research Symposium in Cincinnati, Ohio, April 3-5, 1990, he presented, "Water Movement Through an Experimental Soil Liner. A similar talk, "Conductivity and Transit Time Estimates of a Soil Liner," was presented for the Seventh Annual Water Resources Planning and Management Division Specialty Conference, April 17-21, 1990.

Robert J. Krumm presented the paper, "Techniques for Automating Data from a County Soil Survey: A Case Study for Champaign County, Illinois," for the Midwest/Great Lakes ARC/INFO Users Conference at Madison, Wisconsin, October 18, 1989. For the symposium, Remote Sensing and GIS, at the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1989, Robert Krumm presented the invited paper, "Geographic Information Systems Applications at the State Level: Responding to Environmental Protection Issues in Illinois." The paper, "Unraveling Complex Geologic Settings Using GIS," was co-presented with **E. Donald McKay, Lisa R. Smith, and Robert R. Pool** at the Tenth Annual International ARC/INFO Users Conference, Palm Springs, California, May 14, 1990.

Carl W. Kruse presented the papers, "Production of Premium Liquids by Mild Gasification," "Evaluation of Reagent Selectivity in the Flotation of Coal," "The Illinois Basin Coal Sample Program," and "Implications of an 'Ordered' Heteroatom Distribution in Coal," at the Illinois Coal Development Board's Seventh Annual Contractors' Technical Meeting, sponsored by the Center for Research on Sulfur in Coal at Urbana, Illinois, August 1-3, 1989. At the Third International Conference on Processing and Utilization of High-Sulfur Coal at Ames, Iowa, November 13-16, 1989, he presented the paper, "Hydrocarbon Liquid Fuels by Coal Pyrolysis: Literature Review," and chaired one of the technical sessions.

Timothy H. Larson presented the paper, "Two-Dimensional Heat and Moisture Flow Modeling: Application to Shallow Geothermal Surveys," at the national meeting of the American Geophysical Union, Baltimore, Maryland, May 29-June 1, 1990.

Morris W. Leighton, Dennis R. Koiata and Donald F. Oltz, aided by **Jacquelyn L. Hannah**, co-presented the poster, "Interior Cratonic Basins," at the American Association of Petroleum Geologists 1990 Annual Meeting in San Francisco on June 5, 1990.

John M. Lytle and Joseph FitzPatrick co-presented the paper, "ISGS Aggregate Flotation: Advanced Physical Fine Coal Cleaning and Scale-Up Testing," at the Illinois Coal Development Board's Seventh Annual Contractors' Technical Meeting sponsored by the Center for Research on Sulfur in Coal at Urbana, Illinois, August 1-3, 1989.

Dennis P. McKenna presented the paper, "Persistence and Mobility of Alachlor and Atrazine in Loessial Soils," at the conference on Agricultural Impacts on Ground Water Quality sponsored by the National Water Well Association, February 20-21, 1990, at Kansas City, Missouri. At the National Symposium on Water Quality sponsored by the U.S. Geological Survey at Orlando, Florida, November 12-17, 1989, Dennis McKenna presented the invited paper, "Groundwater Protection Programs in Illinois: Application of Geologic Mapping and Basic Hydrogeologic Principles."

Donald G. Mikulic presented the papers, "Ancient Reefs: T.C. Chamberlin's Work on the Silurian of Eastern Wisconsin and Silurian Konservat Lagerstätten in the Silurian of North America," at the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1990.

Duane M. Moore presented the paper, "Mineralogy of the Eocene Ghazij Shale, Western Indus Basin, Pakistan," at the Ninth International Clay Conference, Strasbourg, France, August 28-September 2, 1989.

Rodney D. Norby and C. Plus Weibel presented the paper, "Sedimentologic and Micropaleontologic Study of a Core Through the Mississippian-Pennsylvanian Boundary in Southern Illinois," at the annual meeting of the South Central Section of the Geological Society of America at Stillwater, Oklahoma, March 5, 1990. The paper was presented as part of a Pander Society symposium.

Donald F. Oltz presented the papers, "Focusing Future Exploration in a Mature Basin: Maturation and Migration Models Integrated with Timing of Major Structural Events in Illinois" and "Reservoir Heterogeneity in the Illinois Basin: A Program Focused Toward the Independent Producer," at the annual meeting of the Eastern Section of the American Association of Petroleum Geologists at Bloomington, Indiana, September 12-13, 1989. He also chaired two of the technical sessions.

Samuel V. Panno presented the paper, "Fluctuations in the Measurement of Water Infiltration into a Field-Scale Soil Liner," at the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1989. Samuel Panno chaired the session in which his paper was presented.

Vickie L. Poole presented the paper, "Trends in the 10,000 mg/l TDS Isocon in Groundwater South of the La Salle Anticlinal Belt, Illinois," at the annual meeting of the Geological Society of America, St. Louis, Missouri, November 6-9, 1989.

J. Bruno Risatti and Joseph FitzPatrick co-presented the paper, "Microbial Suppression of Pyrite from Illinois Coals: Engineering and Scale-Up," at the Illinois Coal Development Board's Seventh Annual Contractors' Technical Meeting sponsored by the Center for Research on Sulfur in Coal at Urbana, Illinois, August 1-3, 1989.

Massoud Rostam-Abadi presented the papers, "Sorbent Evaluation for Pressurized Fluidized-Bed Combustors," "Combustion Characteristics of Coal-Derived Solid Fuels," and "Development and Evaluation of High Surface Area Hydrated Lime for SO₂ Control," at the Illinois Coal Development Board's Seventh Annual Contractors' Technical Meeting sponsored by the Center for Research on Sulfur in Coal at Urbana, Illinois, August 1-3, 1989.

Beverly Seyler presented the papers, "Depositional Analysis Based on Electric-Log Character of Cypress Sandstone (Chesterian) in Illinois" and "Analysis of Valmeyeran (Middle Mississippian) Aux Vases Sandstone Reservoir," at the annual meeting of the Eastern Section of the American Association of Petroleum Geologists at Bloomington, Indiana, September 11-13, 1989.

Lisa R. Smith presented the paper, "Producing Derivative Maps from Automated Map and Tabular Well Data," at the Midwest/Great Lakes ARC/INFO Users Conference, University of Wisconsin at Madison, October 14, 1989.

Christopher J. Stohr presented the papers, "Synthetic Aperture Radar Experiments in Western Illinois" and "Remote Sensing Investigations at a Hazardous Waste Landfill," at the fall meeting of the American Society for Photogrammetry and Remote Sensing, September 17-21, 1989, in Cleveland, Ohio. At the annual meeting of the North Central Section, Geological Society of America, he presented, "Preliminary Interpretation of Synthetic Aperture Radar of Western Illinois for Drainage and Archaeological Sites."

Wen-June Su presented the paper, "Application of a PC-Based Data Acquisition System to Rock Mechanics Testing and Evaluation of a Calibration Problem," at the Thirty-second annual meeting of the Association of Engineering Geologists at Vail, CO, October 1-6, 1989. At the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1989, he presented, "Sodic Soils in Illinois."

Gail D. Taylor presented the paper, "GIS Application for Coal Mine Permit Review in Illinois," at the Midwest/Great Lakes ARC/INFO Users Conference, University of Wisconsin-Madison, October 14, 1989.

Paul D. Terpstra presented the paper, "Rapid Development of a Headland-Bay Beach on the Illinois Lake Michigan Shore," at the annual meeting of the North Central Section, Geological Society of America at Macomb, Illinois, April 26-27, 1990. At the Thirty-Third Annual Conference on Great Lakes Research at Windsor, Ontario, May 13-17, 1990, Paul D. Terpstra presented, "Rapid Development of a Log-Spiral Beach on the Illinois Shoreline." He presented the same talk for the delineation of erosion hazard shorelands workshop sponsored by the International Joint Commission at Cleveland, Ohio, June 21-23, 1990.

C. Brian Trask presented the paper, "Information System on Illinois Coal V: Data Base Promotion," at the Illinois Coal Development Board's Seventh Annual Contractors' Technical Meeting sponsored by the Center for Research on Sulfur in Coal at Urbana, Illinois, August 1-3, 1989.

C. Plus Weibel presented the paper, "Depositional Environments and Regional Sedimentological Control of the Caseyville Formation, Southern Illinois Basin," at the annual meeting of the Eastern Section, American Association of Petroleum Geologists, September 11-13, 1989, in Bloomington, Indiana. At the annual meeting of the South Central Section of the Geological Society of America in Stillwater, Oklahoma, he presented the paper, "Sedimentologic and Micropaleontologic Study of a Core Through the Mississippian-Pennsylvanian Boundary in Southern Illinois."

Stephen T. Whitaker presented the poster papers, "A Gravity Survey of Marine Field: Case Study for Silurian Reef Exploration," and "Regional Cross Section Program for the Illinois Basin," at the annual meeting of the Eastern Section, American Association of Petroleum Geologists, September 11-13, 1989, Bloomington, Indiana.

John D. Yeko presented the paper, "CONQUeST, a Menu-Selectable Database System," at the annual meeting of the Eastern Section, American Association of Petroleum Geologists in Bloomington, Indiana, September 11-13, 1989.

Scientific Workshops/Training Courses Attended or Taught

Daniel J. Adomaitis, Kristi K. Brewer, and Gwen L. Donnals participated in a workshop, "Thermal Analysis Techniques," held by Perkin-Elmer in Urbana, March 20, 1990.

H. Wayne Bang, Scott Beatty, Dwain J. Berggren, Cheri A. Chenoweth, Joan E. Crockett, Ilham Demir, Wayne T. Frankle, John P. Grube, Dennis J. Haggerty, Bryan G. Huff, Richard H. Howard, Russell J. Jacobson, John M. Masters, Kenneth R. McGee, Donald F. Oltz, Richard J. Rice, Michael L. Sargent, Beverly Seyler, Colin G. Treworgy, Robert C. Vaiden, C. Plus Weibel, and Stephen T. Whitaker participated in the workshop, "Qualitative Analysis of Old-Style Electric Logs," organized by the Oil and Gas Section and presented by Erwin King in Champaign in April 1990. Erwin King, a logging consultant from Tulsa, Oklahoma, has 35 years of experience with ARCO. **Hannes E. Leetaru** attended an earlier session of the workshop presented at Grayville, Illinois, March 20-21, 1990.

Phyllis L. Bannon participated in workshops, "Legal Liabilities Facing the Environmental Professional," on October 25, 1989, at Chicago, Illinois, and "Underground Storage Tanks," on June 6, 1990, at Palos Hills, Illinois. Both were organized by the Illinois Association of Environmental Professionals. She also participated in the Chicago Bar Association's program, "Current Environmental Developments Affecting Real Estate," held on June 28, 1990. She also participated in the workshop held at the Savoy office, January 8-12, for the members of the IDOT environmental property assessment project team. That workshop provided training in the proper use of several instruments used by the team in their field work.

Robert A. Bauer participated in the short course, "Environmental Site Assessments," sponsored by the Association of Engineering Geologists in Chicago, Illinois, October 24, 1989. He also participated in an 8-hour short course, "First-On-The-Scene Awareness Program for Responses to Hazardous Waste Situations," sponsored by the University of Illinois Institute of Labor and Industrial Relations. Also at the University of Illinois, October 18-19, 1989, he participated in the Ralph B. Peck Series of Geotechnical Case History presentations entitled "A Tale of Four Tunnels and Learning from the Ground."

Scott Beatty, John P. Grube, Hannes E. Leetaru, and Kenneth R. McGee participated in workshops and a symposium, "Pore Geometry and Formation Evaluation—Pay Recognition—Subtle Trap Definition," at Western Michigan University, Kalamazoo, Michigan, December 5-6, 1989.

Richard C. Berg participated in the workshop, "Proposed Martinsville Alternative Site for the Low-Level Radioactive Waste Disposal Facility at Martinsville," October 2, 1989, and the "Report Coordination Workshop," sponsored by Battelle Memorial Institute (prime contractor for the LLW siting studies) at Springfield, January 16-17, 1990.

Richard A. Cahill participated in the "Midwest Environmental Chemistry Workshop" at Bloomington, Indiana, October 13-14, 1989. He also attended an education seminar, "Applications of Gas Chromatography with a New Atomic Emission Detector," presented by Hewlett-Packard Company at St. Louis, Missouri, January 23, 1990. For the Illinois Environmental Protection Agency's Office of Ecotoxicology, Richard A. Cahill offered a workshop presentation entitled "What a Sediment Sampling and Analysis Program Can Do to Help Understand Pollution Problems in Illinois Lakes and Rivers: Examples from the Work of the Illinois State Geological Survey."

Melissa Chou participated in the workshop, "PCs for Gas Chromatography and Gas Chromatography/Mass Spectroscopy," at the annual meeting of the Federation of Analytical Chemistry and Spectrometry Societies in Chicago, Illinois, October 1-6, 1989.

Joseph Chou and John Valkenburg participated in the short courses, "Principles of Integration and the Calculation Method for Spectra-Physics Computing Integrators," and "Data Communication Using 'LabNet' software," offered by Spectra-Physics Corp., at St. Louis, Missouri, July 11-12, 1989. Joseph Chou and **Gary B. Dreher** also participated in the workshop, "Capillary Column Gas Chromatography," sponsored by the University of Illinois College of Veterinary Medicine and offered by P. J. Cobert Associates, Inc., and J & W Scientific, Inc., September 22, 1989. On February 1, 1990, Joseph Chou participated in a workshop, "Increasing Productivity in the Environmental Laboratory," offered by Finnigan Mat. at St. Louis, Missouri, and at Norfolk, Virginia, May 9-10, 1990, he participated in the Thirteenth Annual EPA Conference, "Analysis of Pollutants in the Environment."

Michael J. Chrzastowski participated in the Second Annual U.S. Geological Survey Workshop on Southern Lake Michigan Coastal Erosion, February 6-7, 1990 at St. Petersburg, Florida. He also participated in the Illinois-Indiana Sea Grant Program Workshop on Coastal Processes at the University of Illinois-Chicago, Illinois, March 23, 1990.

Joan E. Crockett participated in the short course, "Development Geology," sponsored by the American Association of Petroleum Geologists at Aurora, Colorado, November 13-15, 1989.

B. Brandon Curry participated in the short course, "Quaternary Climates: The Ocean Sedimentary Record," in connection with the annual meeting of the Geological Society of America at St. Louis, Missouri, November 5, 1990. He also completed a 15-week, one credit hour course in scanning electron microscopy taught in the Biology Department of the University of Illinois. In September 1989, he traveled to Denver to meet with Richard Forester of the U.S. Geological Survey to discuss research on ostracodes and lacustrine sediments.

Ilham Demir and Richard D. Harvey participated in a workshop on fluorescence microscopy held at Southern Illinois University at Carbondale, November 1-2, 1989. They demonstrated fluorescence microscopy techniques for SIU students and others at the workshop. **Richard D. Harvey** also participated in a workshop-seminar on confocal microscopy at the Beckman Institute, Urbana, Illinois, February 23, 1990.

Joseph A. Devera taught a workshop on ichnofossils at New Harmony, Indiana, in November as part of premeeting field trip no. 3 in connection with the annual meeting of the Geological Society of America.

William S. Dey and Edward Mehnert participated in a workshop on the use of the USEPA's RUSTIC program for computer simulation of transport of pesticides in the unsaturated and saturated zones held at Athens, Georgia, September 18-21, 1989.

William G. Dixon, Jr., and Michael S. Summers participated in the 24-hour industrial emergency response training program at the University of Illinois in Champaign, September 25-28, 1989. They also participated in a workshop for staff of the Environmental Property Assessment project held at Savoy, Illinois, January 8-11, 1990.

J. James Eldel represented the Society of Exploration Geologists and participated extensively in the workshop to develop an integrated earth science curriculum for use in grades K-12. The workshop, held at Red Lodge, Montana, in August 1989, was sponsored by the American Geological Institute and the National Science Foundation. He also attended a Padgett-Thompson seminar on managing problem employees.

Anne L. Erdmann took a short course, "Introduction to UNIX," presented at the University of Illinois, October 23-26, 1989. She also participated in a short course on AML Applications Programming at the Environmental Systems Research Institute, September 28-29, 1989, in Redlands, California.

Leon R. Follmer presented an invited lecture on soil genesis for the Illinois Soil Classifiers Association short course, "Soil Evaluation for On-Site Waste Water Disposal," at Crystal Lake, Illinois, September 22-23. He also attended a field trip with the short-course participants.

Wayne T. Frankle participated in the coal bed methane workshop sponsored by the Gas Research Institute, Denver, Colorado, March 5, 1990.

Christine S. Fucclolo and Donald G. Mikulic participated in "The Age of Dinosaurs" short course on paleontology offered by the Paleontology Society immediately before the annual meeting of the Geological Society of America in St. Louis, Missouri, November 1989.

Kelth C. Hackley participated in the short course, "Introduction to Ground Water Chemistry," offered by the Association of Ground Water Scientists and Engineers, a division of the National Water Well Association, at San Francisco, California, June 12-14, 1990.

Ardith K. Hansel presented a talk on the stratigraphy and surficial geology of northeastern Illinois for the short course, "Soil Evaluation for On-Site Waste Water Disposal," sponsored by the Illinois Soil Classifiers Association at Crystal Lake, Illinois, September 22-23, 1989. She also participated on the field trip in conjunction with the short course.

Paul C. Heigold participated in a workshop, "National Earthquake Hazards Reduction Program," sponsored by the U.S. Geological Survey and Memphis State University, November 15-16, 1989, at Memphis. The meeting focused on research needs in the vicinity of the New Madrid Seismic Zone. He made presentations on "aspects of seismicity and seismic risk in the central Mississippi Valley" for a teacher workshop at DuQuoin, March 9, 1990, and for the Illinois Rural Water Association at John Logan College, Carterville, Illinois. On January 5, 1990, Paul C. Heigold, **Robert A. Bauer, Paul B. DuMontelle, and Timothy H. Larson** met with representatives of the Indiana and Kentucky Surveys at New Harmony, Indiana, to coordinate and plan research proposals to be submitted to the U.S. Geological Survey National Earthquake Hazards Reduction Program special FY 1990 funding for research on the New Madrid Seismic zone.

Randall E. Hughes and Duane M. Moore participated in a short course, "Modern Powder Diffraction Methods," November 5-6, 1989, at St. Louis, Missouri, in connection with the annual meeting of the Geological Society of America.

Donald A. Keefer participated in the workshop, "Environmental Issues of the Great Lakes Basin," the Great Lakes GIS Workshop, held at Southgate, Michigan, October 10-12, 1989.

Latif A. Khan served as moderator for the workshop, "Mine Subsidence and Structures During Reclamation," at the 1990 Symposium on Mining at Knoxville, Tennessee, in May 1990.

Myrna M. Killey discussed soil chemistry and contaminant movement in soils for the participants of the ISGS workshop for Illinois Department of Transportation staff at Savoy, January 10, 1990.

Dennis R. Kolata participated in a workshop, "How to Be a Better Department Manager," offered by Padgett-Thompson, December 5, 1989.

Ivan G. Krapac participated in a U.S. Geological Survey short course, "Statistical Analysis of Hydrological and Chemical Data," at Denver, Colorado, April 24-28, 1989.

Robert J. Krumm, E. Donald McKay, Sally Denhart, Jonathan H. Goodwin, and Morris W. Leighton participated in the GIS workshop for state geologists and their staffs at Madison, WI, June 9, 1990, in conjunction with the annual meeting of the Association of American State Geologists.

Chao-Li (John) Liu participated in the short course, "Application of Environmental Isotopes to Practical Ground Water Studies," sponsored by the National Water Well Association at San Francisco, California, June 12-14, 1990.

John M. Masters participated in the short course, "Glaciotectionic Structures," taught by James Aber, November 5, 1990, in conjunction with the annual meeting of the Geological Society of America at St. Louis, Missouri.

Dennis P. McKenna presented the invited paper, "Geologic Mapping for Protection of Groundwater Resources," at the workshop for information exchange on models and data needs relating to the impact of agricultural practices on water quality, sponsored by the U.S. Geological Survey and U.S. Department of Agriculture at Reston, Virginia, February 5-8, 1990. He also presented "Water Quality Telenet Program: What's in Illinois Groundwater" to the University of Illinois Cooperative Extension Service Staff Development Workshop on December 4, 1989.

Michael V. Miller participated in the workshop, "No Net Loss and the Role of Restoration and Creation," sponsored by the U.S. Army Corps of Engineers and the Association of Wetland Managers at Johnson, Michigan, April 2-7, 1990.

Duane M. Moore participated in the short course, "Rheology of Clay/Water Systems," in conjunction with the annual meeting of the Clay Minerals Society, Sacramento, California, September 24-28, 1989.

Walter J. Morse participated in a workshop on karst hydrology offered by the National Water Well Association at Springfield, Missouri, November 27-December 1, 1989. He also attended the short course, "Groundwater Monitoring Principles and Sampling Techniques," given April 16-17, 1990, at Lexington, Kentucky.

William R. Roy presented the lecture, "Fate and Transport of Contaminants in the Environment," for the workshop for Illinois Department of Transportation staff at Savoy, Illinois, January 10, 1990.

Nicholas P. Schneider participated in the short course, "Geotechnical Aspects of Groundwater Contamination, Clean-Up and Waste Containment," offered by the Geological Engineering Foundation at Tahoe City, California. He also participated in the short course, "Soil Chemistry of Hazardous Materials," offered by the Hazardous Materials Control Research Institute at Washington, DC. In conjunction with the annual meeting of the Geological Society of America at St. Louis, Missouri, Nicholas P. Schneider took the short course on "Glaciotectionic Structures and Landforms."

Edward C. Smith spoke on the hydrogeology of Lake County to area water well drillers at a symposium at Lake County Community College sponsored by the County Public Health Department. The symposium was held May 3, 1990, to acquaint the drillers with new county regulations on permitting water wells.

Christopher J. Stohr, David L. Reinertsen, and several local earth science teachers taught a workshop on use of satellite image maps in the classroom for the Illinois Science Teachers Association annual meeting at Parkland College, November 3-4, 1989.

Wen-June Su participated in the workshop on Environmental Property Assessments offered by the North-Central Section, Association of Engineering Geologists, October 24, 1989, at Chicago, Illinois.

C. Pius Weibel was an instructor for the workshop, "Sedimentological Analysis and Depositional Environments of the Lower Pennsylvanian Caseyville Formation," and attended the workshop, "Ichnofossil Assemblages and Associated Lithofacies of the Lower Pennsylvanian (Caseyville and Tradewater Formations), Southern Illinois." At the annual meeting of the American Association of Petroleum Geologists at San Francisco, California, C. Pius Weibel participated in the short course on "Hydrogeology/Waste Management: An Introduction to the Fundamentals and Principles of Ground-Water Science," sponsored by the National Water Well Association.

Stephen T. Whitaker participated in the "Exploration and Development Advanced Technology School" sponsored by the American Association of Petroleum Geologists at Dallas, Texas, October 27-29, 1989. He also attended the "Illinois Basin Core Workshop for Cambro-Ordovician Rocks," offered by RPI International at Bloomington, Indiana, May 2, 1990.

Participation In Scientific Conferences and Field Trips

Terrie P. Adams, William G. Dixon, Jr., and Anne M. Graese attended the semiannual meetings of the Illinois Groundwater Association in Champaign on October 16, 1989, and in Joliet on March 22, 1990. **Joseph T. Kelleher, Brenda Bouché Mehnert, and Dan J. Van Roosendaal** attended the fall meeting in Champaign. **Terrie P. Adams and William G. Dixon, Jr.**, attended the Illinois Association of Environmental Professionals on October 25.

Daniel J. Adomaitis, Kristi K. Brewer, Richard A. Cahill, Chen-Lin Chou, Heinz H. Damberger, Joseph A. DeBarr, Ilham Demir, J. James Eldel, Lawrence B. Kohlenberger, David L. Moran, David M. Rapp, William R. Roy, Richard H. Shiley, and Alan D. Williams attended the Seventh Annual Contractors' Technical Meeting of the Illinois Coal Development Board held August 1-3, 1989, at Urbana.

Daniel Adomaitis, Chen-Lin Chou, B. Brandon Curry, Jonathan H. Goodwin, James R. Gastineau, Anne M. Graese, Keith C. Hackley, Richard D. Harvey, Bruce R. Hensel, Randall E. Hughes, Russell J. Jacobson, John P. Kempton, Myrna M. Killey, Chao-Li (John) Liu, John M. Masters, Michael V. Miller, Duane M. Moore, Russell A. Peppers, Edward C. Smith, Christopher J. Stohr, C. Brian Trask, and Dan J. Van Roosendaal attended the 1989 annual meeting of the Geological Society of America held at St. Louis, Missouri, November 6-9, 1989.

H. Wayne Bang participated in the annual meeting of the Society of Petroleum Engineers held in San Antonio, Texas, October 1989. While there, he served as a referee for the student paper contest and attended the geological field trip. He also attended the annual meeting of the Eastern Section of the American Association of Petroleum Geologists at Bloomington, Indiana, in March 1990, and several of the monthly meetings of the Illinois Geological Society.

Robert A. Bauer and other members of the Illinois Mine Subsidence Research Program team presented a display on the program at the annual meeting of the Illinois Mining Institute at Mt. Vernon, September 28-29, 1989. Prior to the meeting, **Robert A. Bauer, Paul B. DuMontelle, and J. James Eldel** led a field trip to show T. S. Ary (Director of the U.S. Bureau of Mines) and William Shafer (consultant to the Committee on Interior and Insular Affairs of the U.S. House of Representatives) evidence of the surface effects of underground longwall coal mining in southern Illinois. Robert A. Bauer and others also presented the IMSRP display at a meeting of the Board of Directors of the Society for the Illinois Scientific Surveys at Champaign, October 5, 1989. Robert A. Bauer also participated in "Superfund '89," the 10th National Conference of the Hazardous Materials Control Research Institute at Washington, DC, November 27-29, 1989, and the 76th Annual Transportation and Highway Engineering Conference in Champaign, February 28, 1990. Robert A. Bauer and **Paul B. DuMontelle** also attended the meeting,

"Mining Industry Under Siege," sponsored by the American Mining Congress at Mt. Vernon, Illinois, February 15-16, 1990.

Robert A. Bauer, Paul B. DuMontelle, Paul C. Heigold, Timothy H. Larson, Suzanne Muckensturm, and David L. Reinertsen attended the meeting, "Earthquake Hazards Reduction in the Central U.S.," sponsored by the Central U.S. Earthquake Consortium in Springfield, January 25, 1990.

Robert A. Bauer, Joseph T. Kelleher, Brenda Bouché Mehnert, and Dan J. Van Rosendaal attended the 31st U.S. Rock Mechanics Symposium in Golden, Colorado, on June 18-20.

James W. Baxter participated in the annual meeting of the Society of Mining Engineers at Salt Lake City, Utah, February 25-March 1, 1990. He was also co-leader, with **Paul B. DuMontelle, John M. Masters, and Alan Goodfield**, of the field trip, "Engineering Geology and Industrial Minerals of the Greater St. Louis-Illinois Area," at the Geological Society of America annual meeting, November 7, 1990. As a follow-on to that field trip, James W. Baxter visited outcrop and quarry sections in Illinois and Missouri with Paul Brenckle of Amoco Production Company, the Chair of the Lower Carboniferous (Mississippian) boundary working group of the Subcommittee on Mississippian Stratigraphy. He and the other three participants on this excursion were seeking information on the position of the Osage-Meramecan boundary in the type area of the Mississippian System.

Scott Beatty, J. James Eldel, Anne M. Graese, John P. Grube, Richard D. Harvey, Richard H. Howard, and Richard J. Rice attended the annual meeting of the Eastern Section of the American Association of Petroleum Geologists at Bloomington, Indiana, September 11-12, 1989. Before the meeting, on September 10, **Richard Harvey and Richard Howard** participated in a field trip to Turkey Run State Park, Parke County, Indiana, to study, "The Association of Tidal and Fluvial Sediments Within Lower Pennsylvanian Rocks."

Scott Beatty, John P. Grube, Bryan G. Huff, Kenneth R. McGee, Richard J. Rice, and Stephen T. Whitaker participated in a field trip to outcrops of the Aux Vases and Cypress Formations in the vicinity of Carbondale, Illinois, November 28-December 1, 1989. The trip was led by **Beverly Seyler**.

Scott Beatty, Joan E. Crockett, Ilham Demir, John P. Grube, Paul C. Helgold, Bryan G. Huff, Kenneth R. McGee, Donald F. Oltz, Rodney R. Ruch, Beverly Seyler, and Stephen T. Whitaker attended the annual meeting of the Illinois Oil and Gas Association in Evansville, Indiana, in March 1990. All of them helped to staff the large display booth for the improved oil recovery research program.

Scott Beatty, Joan E. Crockett, Wayne T. Frankle, John P. Grube, Dennis J. Haggerty, Richard H. Howard, Bryan G. Huff, Hannes E. Leetaru, Kenneth R. McGee, Richard J. Rice, Michael L. Sargent, Beverly Seyler, and Stephen T. Whitaker attended one or more of the monthly meetings of the Illinois Geological Society held at various locations in southern Illinois during the year.

Richard C. Berg and B. Brandon Curry participated in the annual meeting of the Illinois Department of Nuclear Safety, "The Next Milestone Toward Low-Level Nuclear Waste Disposal in Illinois," at the Westin Hotel, Chicago, Illinois, December 11-12, 1989.

Dwain J. Berggren attended the annual meeting of the Illinois Science Teachers Association, November 2-3, 1989.

Subhash B. Bhagwat, Chen-Lin Chou, Paul B. DuMontelle, Wayne T. Frankle, and Brenda Bouché Mehnert attended the annual meeting of the Illinois Mining Institute in Mt. Vernon, Illinois, September 28-29, 1990.

Subhash B. Bhagwat attended the Symposium on Comparative Economics of Clean Coal Technologies, March 26-27, 1990 in Washington, DC.

Ross D. Brower and Philip C. Reed attended the annual exposition of the Illinois Specialty Growers Association held in Springfield, Illinois, January 15-17, 1990, in conjunction with the annual meeting of the Illinois Irrigation Association. While there, they mounted and staffed an educational display about

groundwater information services available from ISGS and answered questions from the public. Ross Brower, Philip Reed, and **Robert C. Valden** mounted and staffed a similar display at the 1990 Midwest Water Well Exposition in St. Charles, Illinois, May 21-22, 1990. The meeting was sponsored by the National Water Well Association.

David Brutcher and Brenda Bouché Mehnert co-authored a paper with Colin Booth, "Effects of Longwall-Induced Subsidence on Groundwater Hydrology in Southern Illinois," which was presented by Colin Booth at the American Mining Congress/Illinois Coal Association Seminar in Mt. Vernon, Illinois, on February 16, 1990.

Richard A. Cahill attended the annual meetings of the American Chemical Society in Miami Beach, Florida, August 1-3, 1989, and at Boston, Massachusetts, April 22-27, 1990. He also attended the annual meeting of the Geological Society of America at St. Louis, Missouri, November 6-9, 1989. On June 20, 1990, Richard A. Cahill assisted Gregory Cope of the U.S. Fish and Wildlife Service Lacrosse, Wisconsin, office in collecting sediment samples from Lake Peoria. He also provided maps and reports on ISGS studies to assist Gregory Cope in his research on cadmium and other heavy-metal toxicity of the sediments.

Chen-Lin Chou participated in the Twenty-eighth International Geological Congress held at Washington, DC, July 9-19, 1989. He also attended the Third International Conference on Processing and Utilization of High-Sulfur Coals, held at Ames, Iowa, November 14-16, 1989.

Chen-Lin Chou, Heinz H. Damberger, Wayne T. Frankie, Richard D. Harvey, and Donald J. Lowry participated in the Sixth Annual Meeting of the Society for Organic Petrology at Urbana, Illinois, October 29-31, 1989. Richard D. Harvey was the organizer of the meeting which brought 58 participants from around the world to Urbana to discuss techniques and research results.

Gayla K. Coats attended the fall meeting of the Illinois Mapping Advisory Committee, the annual meeting of the Western Great Lakes Region of the American Society for Photogrammetry and Remote Sensing and the Southern Lake Michigan Society of the American Congress on Surveying and Mapping held November 16, 1990, at the Regional Center of the U.S. Bureau of the Census in Westchester, Illinois.

Dennis D. Coleman attended the annual meetings of the Geochemical Society held in conjunction with the Geological Society of America annual meeting in St. Louis, Missouri, November 6-9, 1990. At the Thirteenth Annual Landfill Gas Symposium sponsored by the Governmental Refuse Collection and Disposal Association, March 27-29, 1990, he participated in a field trip to a landfill with an operating gas collection and electricity generating system and to a state-of-the-art laboratory for analysis of groundwater.

Charles Collinson, Christine S. Fucciolo, James R. Jennings, and Paul D. Terpstra led a field trip to the Illinois Lake Michigan shoreline for the North Central Geological Society of America meeting. The trip to examine major sites along the Lake Michigan shore in Chicago was held just before the start of the meeting in Macomb.

Joan E. Crockett, Richard H. Howard, Donald F. Oltz, Richard J. Rice, Beverly Seyler, and Janis D. Treworgy attended the Symposium on Mississippian oolites of North America, sponsored by the Indiana-Kentucky Geological Society, September 13, 1989, at Bloomington, Indiana, in connection with the annual meeting of the Eastern Section of the American Association of Petroleum Geologists. Joan E. Crockett and Richard J. Rice also participated in the postmeeting field trip to examine the "Geometry and Depositional Environments of Ste. Genevieve (Mississippian) Oolite Bodies in Southern Indiana." On November 7, 1989, she participated in the Illinois Geological Society field trip to the Galatia (coal) Mine at Galatia, Illinois.

Heinz H. Damberger and Wayne T. Frankie presented the paper, "Coal Bed Methane Gas in Illinois," at the annual meeting of the Illinois Oil and Gas Association in Evansville, Indiana, March 8, 1990. Heinz Damberger also attended the Twenty-eighth International Geological Congress in Washington, DC, July

9-19, 1989, where he was a co-convenor and chair of session C28 "The Geology of Coal Through Time." He also was one of the leaders for the annual field trip for the Coal Geology Division of GSA in early November 1989, in connection with the annual GSA meeting. The trip featured the geological mapping in southern Illinois.

Philip J. DeMaris and W. John Nelson led the field trip, "Geology of the Herrin Coal at Crown II Mine near Virden, Macoupin County, Illinois," for the annual meeting of the North Central Section, Geological Society of America in April 1990.

William S. Dey, Gary B. Dreher, and Edward Mehnert attended the Action for Water Quality conference held at Normal, Illinois, October 24, 1989, by the Soil and Water Conservation Society. William S. Dey also attended the conference on "Agricultural Impacts on Ground Water Quality" sponsored by the National Water Well Association at Kansas City, Missouri, February 20-21, 1990.

William G. Dixon, Jr., attended several of the monthly meetings of the Illinois Association of Environmental Professionals and of the North Central Section of the Association of Engineering Geologists (AEG) in Chicago, Illinois. He also attended the annual meeting of the AEG in Vail, Colorado, October 2-6, 1989. On May 20, 1989, he participated in the annual field excursion of the North Central Section of AEG, a self-guided canoe trip along the Fox River from Sheridan to Wedron to view outcrops of Ordovician dolomites and quarry operations.

Gary B. Dreher attended the International Conference on Metals in Soils, Waters, Plants and Animals, held at Orlando, Florida, April 30-May 3, 1990.

Paul B. DuMontelle attended the monthly meetings of the North Central Section of the Association of Engineering Geologists (AEG). He also attended the spring meeting of the Board of the national AEG and the Association's annual meeting in Vail, Colorado, October 2-6, 1989, and the spring and fall meetings of the Illinois-Indiana Section of the American Institute of Professional Geologists.

Henry P. Ehrlinger attended the annual meeting of the Society of Mining, Metallurgy and Exploration in Las Vegas, Nevada, at the end of February 1990, where he participated in deliberations of some of the governing boards of the Society.

J. James Eldel attended the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1990. While there, he made a presentation on geoscience education to the Council of the Society of Exploration Geologists and, at the request of the SEG Council, made a presentation on the importance of geological mapping to the Council of Delegates of the American Geological Institute. He also represented the Chief at the fall meeting of the Association of American State Geologists. He also attended the conference entitled "Biohydrometallurgy '89" sponsored by EMR CANMET, the U.S. Bureau of Mines and U.S. Department of Energy at Johnson, Wyoming, August 13-18, 1989.

Anne L. Erdmann and E. Donald McKay attended the Tenth Annual ARC/INFO Users Conference sponsored by the Environmental Systems Research Institute at Palm Springs, California, May 14-18, 1990.

Leon R. Follmer participated in the annual meetings of the Soil Science Society of America at Las Vegas, Nevada, October 15-19, 1989, and organized a meeting of the Paleopedology Commission at the meeting. Prior to the Nevada meeting he participated in a soil geomorphology field conference in the California-Nevada area October 12-14, 1989. Leon R. Follmer attended the Illinois Soil Classifiers Association at Mt. Vernon, Illinois, March 24, 1990, and participated in the annual field conference of the Southwest Friends of the Pleistocene held in northeastern Arkansas, March 30-April 1, 1990. Following the International Geological Congress on July 20-26, 1989, Leon R. Follmer, **John M. Masters, E. Donald McKay**, and others from the ISGS hosted and operated a field conference for the members of the INQUA Loess Commission and the North American Working Group on Loess. The conference included a technical session on July 21. Leon Follmer and Donald McKay also led Field Trip 16 on the Quaternary loess and glacial record of southwestern Illinois in connection with the Geological Society of America annual meeting in St. Louis, Missouri, in early November. On March 16-17, 1990,

Leon R. Follmer collaborated with Professor Robert Hall of Indiana University-Purdue University-Indianapolis in a field study of paleosols in Indiana and Illinois.

Wayne T. Frankie, Jonathan H. Goodwin, Christine S. Fucciolo, John M. Masters, Edward C. Smith, and C. Brian Trask attended the annual meeting of the North Central Section, Geological Society of America, Macomb, Illinois, April 26-27, 1990.

Christine S. Fucciolo attended the Thirty-third Conference of the International Association for Great Lakes Research at Windsor, Ontario, May 13-17, 1990.

James R. Gastineau participated in the annual meeting of the American Society for Surface Mining and Reclamation at Charleston, West Virginia, in April 1990.

Anne M. Graese attended the field trip, "Hydrogeology of Shallow Karst Ground-Water Systems in Southeastern Missouri," November 3-4, 1989, in connection with the annual meeting of the Geological Society of America.

Ardith K. Hansel attended the symposium, "The Control of Glacier Dynamics and Subglacial Conditions on Glacial Landforms," sponsored by the INQUA Commission on Formation and Properties of Glacial Deposits at Madison, Wisconsin, July 3, 1989. For the symposium, she discussed "Preliminary Evaluation of the Deforming Bed Model." Following the symposium, she participated in field trips on "Moraine Localities North of Madison, Wisconsin," on July 4, 1989, and "Kettle Interlobate Moraine, Drumlins and Deformed Bed Localities in Eastern Wisconsin," July 5-6, 1989. Ardith K. Hansel also attended the annual meeting of the Geological Society of America at St. Louis, Missouri, November 6-9, and participated in the business meeting of the American Quaternary Association (AMQUA) and the meeting of the INQUA Subcommission on North American Stratigraphy held in conjunction with the GSA meeting. On November 16-17, 1989, Ardith K. Hansel accompanied U.S. Geological Survey geologists S. M. Folger, from the Woods Hole Office, and R. Reynolds, of the Denver Office, on a field excursion to Quaternary localities in northeastern Illinois.

Richard D. Harvey participated in meetings of Committee D-5 on Coal and Coke of the American Society for Testing and Materials held at Nashville, Tennessee, October 2-4, 1989 and Lexington, Kentucky, May 6-9, 1990.

Beverly L. Herzog participated in the semiannual meeting of the Illinois Groundwater Association in Champaign, October 25, 1989, and led a field trip to the experimental earthen liner during the meeting. She also attended the Technical Interchange Meeting at the Urbana Civic Center, February 27, 1990, sponsored by the U.S. Geological Survey Water Resources Division Illinois Regional Office.

Bryan G. Huff attended the annual meeting of the American Association of Petroleum Geologists at San Francisco, California, June 1-6, 1990.

Bryan G. Huff, Richard H. Howard, Kenneth R. McGee, Donald F. Oltz, Beverly Seyler, Stephen T. Whitaker, and H. Wayne Bang participated in a field trip to 3 Star Corporation's underground oil mine at the Siggins Field, Cumberland County, Illinois, on January 23, 1990.

Randall E. Hughes and Duane M. Moore attended the Ninth International Clay Conference in Strasbourg, France, August 28-September 2, 1989. Duane M. Moore participated in a postmeeting field trip to examine the "Eocene Sediments of the Paris Basin," September 3-7, 1989.

Randall E. Hughes, John M. Masters, and Richard B. Berg, visiting scientist from the Montana Bureau of Mines and Geology, participated in the 26th Annual Forum on the Geology of Industrial Minerals, May 13-18, 1990, at Charlottesville, Virginia. The meeting included 2.5 days of field trips to industrial minerals operations in the Virginia Piedmont and Blue Ridge.

Donald A. Keefer and Kenneth Hlinka of the Water Survey discussed "Statewide Prioritization of Groundwater Resources for the Illinois Groundwater Protection Act" at the Fall 1989 meeting of the Illinois Groundwater Association, Champaign, Illinois.

Myrna M. Killey served as a resource geologist on a field trip for minority middle school earth science students in St. Louis, Missouri, November 8, arranged by the Geological Society of America Committee on Women and Minorities in the Geosciences in conjunction with the annual GSA meeting. As president of the Illinois-Indiana Section of the American Institute of Professional Geologists (AIPG), Myrna Killey coordinated all the preparations for the fall meeting held at Champaign, October 16, and presided over the business meeting. As section president, she served on the 1989 and 1990 national Advisory Committees. She also represented the Illinois-Indiana Section at the annual meeting of AIPG at Arlington, Virginia, October 4-7, 1989. While there, she participated in the continuing education course "Environmental Site Assessments for Real Estate Transactions," and took a behind-the-scenes tour of the geology/mineralogy section of the Smithsonian Institution. On January 9, 1990, she attended a meeting of the North-Central Section of the Association of Engineering Geologists.

Ivan G. Krapac attended the International Conference on Municipal Waste Combustion, April 11-14, 1989, at Hollywood, Florida.

Carl W. Kruse attended a symposium on coal structure at the 198th national meeting of the American Chemical Society at Miami Beach, Florida, September 10-15, 1989, as part of the information-gathering task for his project, "Implications of an 'Ordered' Heteroatom Distribution in Coal," for the CRSC. He also attended "Gen-Upgrade 90," the International Symposium on Performance Improvement, Retrofitting and Repowering of Fossil Fuel Power Plants in Washington, DC, March 6-9, 1990.

Hannes E. Leetaru attended the Sixth Annual Vincent E. McKelvey Forum on Mineral and Energy Resources sponsored by the U.S. Geological Survey at Houston, Texas, February 20-22, 1990. At the annual meeting of the Illinois Oil and Gas Association in Evansville, Indiana, March 8-9, 1990, He presented a poster session on analysis of old-style electric logs.

John M. Lytle and J. Bruno Risatti attended the Third International Conference on Processing and Utilization of High-Sulfur Coals at Ames, Iowa, November 13-16, 1989. John M. Lytle chaired the session on physical cleaning of high-sulfur coals.

John M. Masters organized a one-day meeting and field conference for Bjorn Bolviken of the Geological Survey of Norway and representatives of the Illinois, Indiana, and Kentucky Geological Surveys to consider a program to collect and analyze overbank deposits for the purpose of geochemical mapping. He and **Richard A. Cahill** prepared a written report and recommendation as a follow-up to the meeting. John M. Masters also participated in the annual field conference of the Southwest Friends of the Pleistocene held near Forest City, Arizona, March 30-April 1, 1990, and premeeting and postmeeting field trips in conjunction with the annual meeting of the North Central Section, Geological Society of America, April 25 and April 28-29, 1990.

Dennis P. McKenna attended the Midwest Groundwater Quality Protection Challenge meeting at St. Charles, Illinois, November 1-3, 1989, and the annual meeting of the Illinois Chapter, Soil and Water Conservation Society at Bloomington, Illinois, October 24, 1989. For the Society, he presented two talks, "Agricultural Chemicals in Groundwater in Illinois" and "Geologic Mapping and Groundwater Protection." At Council Bluffs, Iowa, May 11-13, 1990, he participated in the annual field conference of the Midwest Friends of the Pleistocene.

Brenda Bouché Mehnert, Samuel V. Panno, Vickie L. Poole, and Dan J. Van Roosendaal attended the semiannual meeting of the Illinois Groundwater Association in Champaign on October 25, 1989. Brenda Bouché Mehnert and Dan J. Van Roosendaal also attended the Thirty-first U.S. Symposium on Rock Mechanics at Golden, Colorado, June 18-20, 1990.

Donald G. Mikulic attended the meetings of the Twenty-eighth International Geological Congress at Washington, DC, July 9-19, 1989. On October 13-15, 1989, he and **Michael L. Sargent** participated in the 53rd Annual Tri-State Geological Field Conference at River Falls, Wisconsin.

Michael V. Miller attended the symposium, "Wetlands: Concerns and Successes," sponsored by the AWRA at Tampa, Florida, September 16-22, 1989.

Duane M. Moore attended the annual meeting of the Clay Minerals Society at Sacramento, California, September 24-28, 1989, and associated field trips in the region.

Rodney D. Norby and C. Plus Welbel attended the annual meeting of the South Central Section of the Geological Society of America at Stillwater, Oklahoma, March 5-6, 1990. They also participated in the premeeting field trip organized by the Pander Society, March 3-4, 1990.

Donald F. Oltz presented the talk, "Update on the ENR-DOE Research Project on Improved Oil Recovery," at the Illinois Oil Producers Association meeting in Evansville, Indiana, June 15, 1990. He attended the fall Membership meeting of the Illinois Oil and Gas Association at Mt. Vernon, Illinois, November 10, 1989.

David L. Reinertsen and Suzanne Muckensturm attended the International Geological Congress in Washington, DC, July 9-13, and staffed the Survey's exhibit booth at this meeting. They were assisted by **Morris W. Leighton, Heinz H. Damberger, and Chen-Lin Chou**.

Richard J. Rice attended a meeting of the Illinois Oil Producers Association at Mt. Vernon, Illinois, September 21, 1989.

Massoud Rostam-Abadi attended the annual meeting of the American Chemical Society, Miami Beach, Florida, September 10-15, 1989.

William R. Roy attended the Twelfth Annual Madison Waste Conference at the University of Wisconsin at Madison, September 20-21, 1989.

Michael L. Sargent attended the Symposium on Mississippi Valley-Type Mineral Deposits, held November 5, 1989, at St. Louis, Missouri, in conjunction with the annual meeting of the Geological Society of America, November 6-9. Prior to the GSA Meeting on November 3-4, Michael L. Sargent and **Janis D. Treworgy** participated in a field workshop in southeast Missouri to examine mineralization in the Upper Cambrian rocks of the area. Following the GSA meeting, Michael L. Sargent and **Phillip C. Reed** accompanied Alan Hildenbrand of the U.S. Geological Survey to examine and collect samples from outcrops of the Cretaceous-Tertiary boundary in southern Illinois.

Nicholas P. Schneider attended the annual meetings of the Geological Society of America at St. Louis, Missouri, November 6-9, 1989. He also attended the Superfund Meeting sponsored by the Hazardous Materials Control, Research Institute at Washington, DC.

Richard H. Shiley attended the International Chemical Congress of Pacific Basin Societies, Honolulu, Hawaii, December 17-22. He and **Lawrence Wu** also attended the annual contractors' technical meeting of the Illinois Corn Marketing Board, March 28, 1990, at Urbana, Illinois.

Christopher J. Stohr attended the International Symposium on Mapping and Geographical Information Systems in San Francisco, California, June 21-22, 1990, where he presented proposed draft guidelines for "Remote Sensing Investigations for Siting and Monitoring Landfills" to a meeting of the American Society for Testing and Materials Committee D18.01.03 (Soil and Rock. Surface and Subsurface Characteristics. Remote Sensing).

Wen-June Su visited the Aerospace Center of the Defense Mapping Agency at St. Louis, Missouri, in conjunction with the annual meeting of the Geological Society of America, November 1-6, 1989. He also attended the Annual Association of Engineering Geologists meeting in Vail, Colorado, on October 2-6.

C. Brian Trask attended the Twenty-eighth International Geological Congress in Washington, DC, July 9-19, 1989. At the annual meeting of the Geological Society of America in St. Louis, Missouri, November 6-9, 1989, Brian Trask participated in three field trips.

Dan J. Van Roosendaal presented the invited talk, "Effects of Longwall Mine Subsidence on Overburden Fracturing and Hydrology in Illinois," at the Third Annual Mined Land Reclamation Technology Transfer Seminar sponsored by the Indiana Coal Mining Reclamation Task Force in Vincennes, Indiana, December 6, 1989. Co-authors of the talk were Brenda Bouché Mehnert, David Brucher and Robert A. Bauer. Dan J. Van Roosendaal also attended the 76th Annual Transportation and Highway Engineering Conference in Champaign, Illinois, February 28, 1990.

C. Plus Weibel organized all the logistics, wrote the guidebook and led the field trip, "Cyclic Strata of the Late Pennsylvanian Outlier, East-Central Illinois," held November 10-11, 1989, as part of the annual meeting of the Geological Society of America (GSA). He also was one of the leaders for the premeeting field trip, "Geology of the Lower Pennsylvanian in Kentucky, Indiana, and Illinois." At the annual meeting of the Eastern Section of the American Association of Petroleum Geologists (AAPG) at Bloomington, Indiana, he attended the premeeting field trip, "Association of Tidal and Fluvial Sediments Within Lower Pennsylvanian Rocks at Turkey Run State Park, Parke County, Indiana." At the South Central GSA meeting in March 3-4, 1990, he attended the field trip, "Middle Carboniferous Lithofacies and Biostratigraphy of the Southern Ozarks" and, at the national AAPG meeting in San Francisco, June 2, 1990, he attended "Geology of the Napa and Sonoma Regions, California."

Lawrence Wu presented the talk, "Cleaning Coal with Corn," at the Thirty-first Annual Corn Dry Milling Conference, Sponsored by the U.S. Department of Agriculture Northern Regional Research Center at Peoria, Illinois, May 30-31, 1990. On March 28, 1990, he reviewed the ethanol coal desulfurization projects at the Illinois Corn Marketing Board Annual Technical Contractors' meeting in Urbana, Illinois. In Auburn, Alabama, July 31-August 3, 1989, Lawrence Wu attended the conference of the Consortium for Fossil Fuel Liquefaction Science. While there, he visited the Wilsonville Coal Liquefaction Facility. In Pittsburgh, Pennsylvania, August 26-29, 1989, he participated in the Sixth Annual Pittsburgh Coal Conference. He also attended a workshop, "Advanced Physical Coal Cleaning: A State-of-the-Art Review," sponsored by the Electric Power Research Institute on the day preceding the Coal Conference.

John D. Yeko presented the talk, "ISGS Oil and Gas Database—The Future is Here," at the Interstate Oil Compact Commission meeting on oil and gas databases in Tulsa, Oklahoma.

Lectures/Classes/Seminars Taught

Robert A. Bauer presented a summary, "Monitoring Subsidence Effects Over Active Longwall Mines in Illinois," at the University of Missouri at Rolla on April 11, 1990.

James W. Baxter spent two days in the field in the Illinois-Kentucky Fluorspar District with graduate student Frank Furman of the University of Tennessee and provided him with advice and information related to the sources of metal mineralization in the District.

Richard C. Berg presented the lecture, "Environmental Geology—The Role of Geology in Making Land-Use Decisions," to the Geography 206 class at the University of Illinois, September 26, 1989, and for the geology seminar at Western Illinois University, April 12, 1990.

Dwain J. Berggren presented a slide-illustrated lecture and led a discussion, "The Geology of the Earth and of Champaign County," for a sub-freshman geography class at University High School in Urbana, September 25, 1989. He also led a demonstration workshop, "Common Rocks and Minerals of Illinois," for fifth and sixth grade science classes at Leal School in Urbana, Illinois, October 3, 1989.

Subhash B. Bhagwat taught a course in Mineral Economics (Mining Engineering 302) for the University of Illinois during the fall semester of 1989. He compiled his own textbook for the course, this year adding three major chapters to the text and substantially revising several other chapters. He advised Mark

Quebral, a PhD student in economics at the University of Illinois, on data collection for studies of the coal mining industry and problems in estimating mining costs.

Richard A. Cahill presented a seminar December 8, 1989, to the Department of Geography, University of Illinois, entitled, "Can Geologists Predict and Map Radon Occurrence?"

Keros Cartwright presented a lecture, "Hydraulic Properties of an Experimental Soil Liner: Preliminary Results," for a University of Illinois Geology Department seminar on November 3, 1989. At the University of Alberta, Canada, he presented a lecture, "Groundwater in the Illinois Basin," on November 28, 1989. He also serves on the thesis advisory committees for an MS candidate at the University of Illinois and a PhD candidate at Northern Illinois University.

Chen-Lin Chou was a thesis advisor for G. Lu, an MS candidate in geology at the University of Illinois at Urbana-Champaign.

Joseph Chou provided technical advice to a graduate student from Northern Illinois University on techniques for preserving samples and analyzing for pesticides in groundwater.

Michael J. Chrzastowski presented a lecture, "Ongoing Coastal Research Along the Illinois Coast," for the weekly seminar series of the Department of Geology, University of Delaware, September 13, 1989. He is advising Hi-Il Yi, a PhD candidate in geology from the University of Delaware who is continuing research begun in Chrzastowski's dissertation. Michael Chrzastowski also offered technical advice to Michael Unger, a PhD candidate at Indiana University-Northwest, Gary, Indiana, who is sampling bottom sediments in the Grand and Little Calumet Rivers, and Timothy McDonald, an MS candidate at Southern Illinois University studying costs/benefits of shore defenses.

Charles Collinson was thesis advisor for James J. Miner, an MS candidate at Northern Illinois University. James Miner's thesis, "The Lake Michigan Icefoot Complex: Conditions of Formation and Destruction and an Evaluation of Winter Erosion at Wilmette, Illinois," is being prepared for publication in the Environmental Geology series.

Joan E. Crockett provided limited technical assistance for Daniel Adams, an MS candidate in geology from the University of Cincinnati, on studies of Bethel-Benoist (Mississippian) sandstone reservoirs in the Illinois Basin.

Heinz H. Damberger is an advisor to Eric Daniels, a candidate for the PhD in geology from the University of Illinois at Urbana-Champaign studying coalification of anthracites in western Pennsylvania.

Joseph A. Devera presented talks about dinosaurs for the Carbondale Boy Scout troops and their parents and for Glendale School in Carbondale, Illinois.

Paul B. DuMontelle is a thesis advisor for Wen-June Su, a PhD candidate in engineering geology at the University of Illinois at Urbana-Champaign.

J. James Eldel showed slides from Alaska and discussed the need for mineral resource exploration in Illinois for students in grades 3 and 4 at Leal School, Urbana. He was also interviewed about mineral exploration issues by members of the Champaign High School debating team.

Leon R. Follmer presented a seminar on loess studies in the Mississippi Valley region to a geography class at the University of Illinois at Urbana-Champaign, September 8, 1989. On January 25, 1990, he discussed the soil geology of the Rhoad archeological site for a geo-archeology class in the geography department. On January 29-30 he presented a lecture on loess-soil studies in the midwest and met with graduate students at the University of Missouri at Columbia. On August 14-15, 1989, he led a field excursion to review Quaternary problems in northern Illinois for graduate students and a geologist from Schleswig-Holstein, West Germany. He also led field excursions to notable central Illinois Quaternary localities for a University of Illinois geography class on September 30, 1989, and for a visiting geomorphologist from Australia on October 28, 1989. Leon Follmer participates extensively in graduate

education in various aspects of soil science at several institutions. For the Department of Geology, University of Illinois, he served as a thesis advisor for five PhD and MS candidates; for the Geography Department, three candidates; and for the Agronomy Department, three candidates. For the geology department at Southern Illinois University at Carbondale, he served as an advisor for three candidates for the MS degree. He is also a thesis advisor for a PhD candidate at Philipps University of Marburg, West Germany, and for Wang Hong, a PhD candidate at the Laboratory of Loess and Quaternary Geology, Academia Sinica, Xian, China. He is an Adjunct Associate Professor in the Departments of Geography and Geology and a Collaborator with the College of Agriculture at the University of Illinois, and an Adjunct member of the geology department faculty at Southern Illinois University at Carbondale.

Richard D. Harvey presented a lecture on coal petrology for the Coal Geology class at Indiana University, March 8, 1990. **Russell A. Peppers** presented a lecture to the same class on March 27, 1990.

Paul C. Heigold participated in a one-hour closed circuit taped television interview for a journalism class at the University of Illinois. The subject of the interview was "Seismicity in the Central Mississippi Valley." He also ran a field demonstration of seismic refraction techniques for a geophysics class from the University of Illinois.

Richard H. Howard is providing informal thesis advice and counsel to Jinazhong Xu, an MS candidate in petroleum geology at Beijing and Amjad Asaf, an MS candidate in geology at Northern Illinois University.

Bryan G. Huff presented a lecture about the geology and production procedures of the underground oil mine in Cumberland County for the Geology of Energy (Geol. 105) class at the University of Illinois on February 7, 1990. He also provided technical assistance to John Kruger, a PhD candidate at the University of Wisconsin at Madison, who is studying dolomitization of lower Devonian carbonates.

Randall E. Hughes and Duane M. Moore presented instruction on x-ray diffraction techniques to a class of nine students in the Department of Geography, University of Illinois. They also reviewed their findings on berthierine pipestone materials for a class in geo-archeology at the University of Illinois. They are extensively involved with students and faculty in a clay minerals discussion group on the campus, and provided advice to several graduate students during the year.

Russell J. Jacobson led a fossil collecting field trip to southern Indiana, October 21-22, 1989, for the Urbana Park district. The trip, attended by about 25 adults and children, has become an annual event. He also presented a talk on earthquakes and plate tectonics for fifth grade classes at Prairie School in Urbana on October 19, 1989, and on dinosaurs for second grade classes at Prairie School in late March, 1990.

Latif A. Khan gave two lectures on mineral processing techniques for the students in Subhash B. Bhagwat's Mineral Economics course during the fall term of 1989 at the University of Illinois.

Myrna M. Killey presented two hands-on workshop sessions called "What Is Illinois Made Of?" at Sangamon State University, Springfield, Illinois, on March 24, 1990; the workshop focused on the kinds of materials left by glaciers and their uses, and was given for seventh and eighth grade girls attending a conference, "Expanding Your Horizons Through Math and Science." She also presented an invited talk, "Glaciers of Southeast Alaska," for geology students and faculty at Ball State University, Muncie, Indiana, on December 20, 1990.

Dennis R. Kolata presented the lecture, "Tectonic Subsidence History of the Illinois Basin," for the RPI workshop and for the Indiana University Geology Department at Bloomington, on November 20, 1989. From December 30, 1989, to January 1, 1990, he was the Lewis G. Weeks Invited Lecturer at the Department of Geology, University of Wisconsin at Madison, where he presented talks on Ordovician K-bentonite correlations and the tectonic subsidence history of the Illinois Basin. He serves on the dissertation committees of three graduate students at the University of Illinois, Queens College, of the

City University of New York, and the University of Cincinnati. He has been consulted regularly by another graduate student at the University of Wisconsin at Madison.

Morris W. Leighton presented a series of lectures, "Interior Cratonic Basins," at 17 universities, research institutions, and geological societies on his AAPG Distinguished Lecture tour this past spring.

Chao-Li (John) Liu provided technical advice on isotope geochemistry and radiocarbon dating for three PhD candidates in the geology from the University of Illinois and a PhD candidate in anthropology from Northwestern University. During the year, the Isotope Geochemistry Laboratory provided 35 free radiocarbon dates and more than 250 $^{13}\text{C}/^{12}\text{C}$ analyses for graduate students doing research in the state.

E. Donald McKay provided assistance for two MS candidates in geography at the University of Illinois at Urbana-Champaign.

Dennis P. McKenna presented a lecture, "Pilot Study: Agricultural Chemicals in Rural Private Wells," for the Agronomy Department Seminar, University of Illinois at Urbana-Champaign, November 21, 1989.

Rodney D. Norby is a member of the dissertation committee for Joseph A. Devera, a PhD candidate in geology at Southern Illinois University at Carbondale.

J. Bruno Risatti provided technical advice and assistance for two PhD candidates in civil engineering at Northwestern University, Evanston, Illinois.

Stephen T. Whitaker talked about the geology of Illinois for the fifth grade class at Robeson Elementary School in Champaign on November 14, 1989. For the second grade class at Robeson, he talked on October 10, 1989, about the duties of the Illinois State Geological Survey.

Offices/Committee Memberships/Services In Professional Societies

Terrie P. Adams serves on the newsletter committee of the Illinois Association of Environmental Professionals.

H. Wayne Bang reviewed groundwater contamination modeling work for the American Petroleum Institute. He also is a member of the Enhanced Oil Recovery expert advisory committee of the Society of Petroleum Engineers.

Robert A. Bauer is Rock Mechanics Chairman for the North Central Section of the Association of Engineering Geologists (AEG), and a member of the Rock Mechanics Committee of the national AEG. At a joint meeting of the student chapters of the Association of Engineering Geologists and the Society of Mining Engineers at the University of Missouri-Rolla on April 11, 1990, he presented the lecture, "Monitoring Subsidence Effects Over Active Longwall Mines in Illinois."

James W. Baxter was appointed to a three-year term on the Research Council of the Society of Mining, Metallurgy and Exploration beginning in March 1990. He is also serving the SME as an Associate Editor and Member of the Editorial Committee for the sixth edition of *Industrial Minerals and Rocks*. For the Society's journal, *Mining Engineering*, James Baxter is a member of the editorial committee of the Industrial Minerals Division and reviews contributions to the journal on subjects related to industrial minerals.

Ross D. Brower has served as historian for the Midwest Groundwater Conference in 1989 and 1990.

Richard A. Cahill is the official ISGS representative to the local chapter of Sigma Xi, the scientific research society.

Keros Cartwright is currently serving as the president of the Illinois-Indiana Section of the American Institute of Professional Geologists. As a member of the Hydrogeology Division of the Geological Society of America, he served during the past year on the Ad Hoc Committee on Stratigraphic Nomenclature

and on the Organizing Committee for the 1989 Annual Meeting. For 1989-90, he is chairing the Division's committee to name the Birdsall Distinguished Lecturer.

Chen-Lin Chou is a member of the U.S. Working Group No. 254, "Metalliferous Black Shales" for the International Geological Correlation Program of the International Geophysical Union. He was also co-editor of the Geological Society of America's Special Paper 248 entitled, "Recent Advances in Coal Geochemistry."

Michael J. Chrzastowski is a member of the U.S. Working Group No. 274, "Coastal Evolution in the Quaternary," for the International Geological Correlation Program of the International Geophysical Union.

Charles Collinson is an associate editor for the Illinois Academy of Sciences.

Joan E. Crockett took office as president of the Illinois Geological Society in September of 1989 after serving during the preceding year as vice president. She also serves on the Nominating Committee of that organization and coordinated the Society's master's level research grant program. For the Illinois Oil and Gas Association, she served during the past year on the "Wildcatter of the Year" selection committee. She prepared background information for Kathy Shirley of the *AAPG Explorer* for an article on the Illinois Basin.

Heinz H. Damberger is co-chair of the Program Committee and secretary-treasurer for the Illinois Mining Institute. He organizes all aspects of the annual meeting each year and serves as editor of the proceedings volume from the meeting published each year. For the Geological Society of America Coal Geology Division, he served on the Medlin Scholarship Award Committee from November 1988 to November 1989. He is also a member of the editorial board of the *International Journal of Coal Geology*.

William G. Dixon, Jr., served as secretary of the Illinois Association of Environmental Professionals during the 1989 calendar year. He also served as editor of *AEG News*, the newsletter of the Association of Engineering Geologists, from April 1988 through April 1990.

Paul B. DuMontelle is a member of the Screening Committee of the Illinois-Indiana Section of the American Institute of Professional Geologists. He compiled and published a directory of the members of the Section. He serves on the Board of Directors of the Association of Engineering Geologists. He is Manager of AEG's Standing Committee on Continuing Education and Chair of the Technical Program Committee for the 1991 Annual Meeting, which is to be held in Chicago. For the North Central Section of AEG, he serves on the Legislative and Nominating Committees.

Henry P. Ehrlinger served as chairman-elect of the Industrial Minerals Division of the Society of Mining Engineers from July 1, 1989, to February 26, 1990. On February 27, he took office as chairman of that division and thereby succeeded to membership on the Board of Directors of the Society of Mining, Metallurgy and Exploration (the new name for SME). He serves ex officio as a member of the Hal Williams Hardinge Award selection committee.

J. James Eldel is a member of the Committee on Committees, the Nominating Committee, and the Ad Hoc Committee on Mapping for the Society of Exploration Geologists (SEG). He retired from the Membership Committee this year and was elected to the SEG Foundation. For the Foundation, he serves on the Nominating and Special Projects Committees.

Leon R. Follmer is co-chair of the Illinois Quaternary Association; president of the North American Loess Working Group of the International Union for Quaternary Research; secretary-treasurer of the Paleopedology Commission of the International Union for Quaternary Research; member of the editorial board of *Catena*, an international journal of soil science, hydrology, and geomorphology; and a member of the International Editorial Advisory Board of the *Journal of Quaternary Science*. He was recently appointed to the working committee on pedostratigraphy of the North American Commission on Stratigraphic Nomenclature.

Anne M. Graese is editor of the *Illinois Groundwater Association Newsletter*.

Ardith K. Hansel is serving as councilor for Historical Geology and Stratigraphy for the American Quaternary Association (AMQUA). She is also a corresponding committee member of the Commission on Formation and Properties of Glacial Deposits: Subglacial Processes and Sediments Work Group for the International Quaternary Association (INQUA) and a Corresponding Committee Member of the INQUA Subcommittee on North American Stratigraphy.

Richard D. Harvey chairs the Subcommittee on Coal Classification of Committee D-5 on Coal and Coke of the American Society for Testing and Materials. He is also Coordinating Editor for the Society for Organic Petrology. He became a member of the editorial board of the *Journal of Coal Quality* in March 1990.

Beverly L. Herzog is a member of the Association of Ground Water Scientists and Engineers and is serving her second three-year term on the editorial board of the *Journal of Ground Water*. She also serves on the editorial board of the *Ground Water Monitoring Review* and is the only AGWSE member serving on both boards at once. She is also a member of the Subcommittee on Soil and Water of Committee D-18 of the American Society for Testing and Materials.

Richard H. Howard is a member of the Potential Gas Committee of the Potential Gas Agency, and the Enhanced Recovery Committee of the Interstate Oil Compact Commission. He is also a member of the Geological Committee of the Illinois Oil and Gas Association.

Bryan G. Huff compiled data for the three-, six-, and ten-year reserve updates for the American Association of Petroleum Geologists. For the AAPG Committee on the Statistics of Drilling, he serves as the Illinois respondent on exploratory well data. He serves as the respondent for monthly oil production statistics for the American Petroleum Institute. He compiles the statistical data used by the Illinois Oil and Gas Association as one of the criteria for the "Wildcatter of the Year" award. He compiled the data on Illinois requested by the Interstate Oil Compact Commission for the national stripper well survey and supplied data for the state agency survey being compiled by the magazine *World Oil*.

Randall E. Hughes served as a councilor of the Clay Minerals Society from 1988 to 1990. He is currently a member of the Nominations and Publicity Committees for the Clay Minerals Society and serves as an Associate Editor for *Clays and Clay Minerals*, the Society's journal. As chairman of the editorial committee of the Industrial Minerals Division of the Society of Mining, Metallurgy and Exploration (SME), he reviews articles on industrial minerals subjects for the journal *Mining Engineering*. He serves on the Mining Engineering and Technical Committees of SME and, in that capacity, organized the preparation of the annual commodity write-ups for clays and barite for the journal.

Latif A. Khan is a member of the Technical Papers Subcommittee for the Society of Mining, Metallurgy and Exploration (SME). He has served on the organizing committee of the National Symposium on Mining since 1987 and is a member of the Program Advisory Committee for the Symposium.

Myrna M. Killey served as president of the Illinois-Indiana Section of the American Institute of Professional Geologists during the fall of 1989. Since January 1990, she has served as newsletter editor for the section and as a member of the Executive Committee. She is also the liaison between the AIPG and the North-Central Section of the Association of Engineering Geologists. For the AEG, she is chairing the Field Trip Program Committee for the 1991 annual meeting.

Dennis R. Kolata is president of the Great Lakes Section of the Society of Economic Paleontologists and Mineralogists. He was also elected a Fellow of the Geological Society of America.

Robert J. Krumm joined with Richard Stenstrom, First Vice President of the National Association of Geology Teachers, to organize the symposium, "GIS and Remote Sensing: Techniques on the Frontier of Change," for the annual meeting of the Geological Society of America at St. Louis, Missouri. Robert Krumm prepared the proposal to the GSA program committee, contacted potential speakers, compiled the abstracts and had them reviewed, scheduled the session, and moderated it at the meeting.

Morris W. Leighton was elected vice president of the Association of American State Geologists (AASG) at its annual meeting June 10-13, 1990. He serves on the AASG Liaison Committee, which met in Washington, DC, October 1-3, 1989, and March 11-13, 1990, to discuss federal/state programs and issues with various federal agencies and congressional staff.

John M. Masters is a member of the Educational Issues Committee of the Society of Mining, Metallurgy and Exploration.

Kenneth R. McGee represented the Windy City Grotto of the National Speleological Society in presenting the Merit Award of the NSS to Armin Kruger for donating ownership of Illinois Cavern to the State of Illinois. The award was presented September 23, 1990, at Waterloo, Illinois, during the annual Mississippi Valley/Ozark Region Speleological meeting.

Donald G. Mikulic is organizing the Paleontological Society short course for 1990 to be given in conjunction with the annual meeting in Dallas in the fall.

Duane M. Moore is chairman of the Publicity Committee of the Clay Minerals Society.

Donald F. Oltz is a member of the Research Committee, Membership Committee and Committee on the Statistics of Drilling for the American Association of Petroleum Geologists.

Russell A. Peppers is a member of the Middle Pennsylvanian Subcommittee of the International Commission on Carboniferous Stratigraphy. He attended a meeting of the Subcommittee in conjunction with the annual meeting of the Geological Society of America at St. Louis, Missouri, November 6-9, 1989. He is also a member of the Working Group on Midcontinent Pennsylvanian Stratigraphy of the Society of Economic Paleontologists.

Vickie L. Poole served as newsletter editor for the Illinois Groundwater Association during fall 1989.

J. Bruno Risatti has served on the Organizing Advisory Committee of the International Conference on Processing and Utilization of High-Sulfur Coals since 1987. The meeting was held at Ames, Iowa, November 13-16, 1989. He was also an invited speaker at the International workshop on Degradative biotechnologies for treating chemical wastes at San Miniato (Pisa), Italy, June 26-29, 1989. He met with the Subcommittee on Biodegradation of Plastics of the American Society for Testing and Materials at Chicago, Illinois, October 13-14, 1989.

Rodney R. Ruch is a chairman of the International Standards Organization Committee TC27/Subcommittee SC5 on "Solid Fuels—Methods of Analysis." In that position, he organized and chaired meetings of the subcommittee held at Sydney, Australia, in November 1989 and at Washington, DC, in March 1990. He also presented reports on ISO activities at meetings of the American Society for Testing and Materials at Nashville, Tennessee, in October 1989, and at Lexington, Kentucky, in May 1990.

Beverly Seyler is a member of the Board of Directors of the Illinois Geological Society and a delegate from the Society to the American Association of Petroleum Geologists. She is the coordinator for the Eastern Section meeting to be held in Champaign-Urbana in 1992.

Christopher J. Stohr chairs the Remote Sensing Committee of the Association of Engineering Geologists. For the American Society of Photogrammetry and Remote Sensing he serves on the Autometric Award and the Alan Gordon Award Committees. He is a member of the American Society for Testing and Materials Committees D18.01.03 (Remote Sensing), D18.01.05 (Geologic Mapping), and D18.01.06 (Investigating and Sampling Soil and Rock).

Wen-June Su is newsletter editor for the North-Central Section of the Association of Engineering Geologists.

CONTRIBUTIONS TO OTHER GOVERNMENT AGENCIES

Testimony/Information Supplied to Local/State/National Committees/Agencies

Robert A. Bauer, Subhash B. Bhagwat, Heinz H. Damberger, Paul B. DuMontelle, Henry P. Ehrlinger, Carl W. Kruse, David L. Moran, J. Bruno Risatti, Massoud Rostam-Abadi, Richard H. Shiley, and Lawrence Wu made presentations about ISGS coal-related research projects for the Survey's Coal Advisory Committee at the Illini Union Building on the University of Illinois campus, May 16, 1990. Other ISGS staff members present at the meeting included **J. James Eidel, Morris W. Leighton (committee secretary), John M. Lytle, and John Simon.**

Robert A. Bauer supplied information on mine subsidence to the Illinois Department of Revenue, to the Springfield Planning Commission, and to the U.S. Bureau of Mines.

Richard C. Berg and Keros Cartwright presented testimony on the low-level radioactive waste disposal facility siting issue before a special panel of the Illinois Senate Executive Committee at Caseyville, Illinois, April 27, 1990. They also reviewed technical issues affecting the proposed siting of a low-level waste disposal facility for members of the Wayne County Citizen's Review Committee and the Wayne County Board at Fairfield, Illinois, October 25, 1989. They provided technical reviews of numerous documents connected with the studies seeking a site for a low-level waste disposal facility during the past year for Battelle Memorial Institute and the Department of Nuclear Safety.

Richard C. Berg and Beverly L. Herzog prepared written comments on the document, "EPA Statement of Ground-Water Principles," at the request of the EPA's Region V Office in Chicago. The comments were submitted on March 5, 1990.

Ross D. Brower and Keros Cartwright attended hearings of the Illinois Pollution Control Board in Springfield, May 17, 1990, and Chicago, June 5, 1990, where regulations concerning underground injection control were considered. Keros Cartwright responded to questions from the Board, and during the past year, he provided technical reviews of several other proposed IPCB rules and regulations.

Richard A. Cahill presented written materials and discussed the topic, "Radon Issues: What Is the Role of the City Government of Champaign," with the Environmental Advisory Commission of the City of Champaign, February 26, 1990. He is also serving as the ISGS representative for the Association of American State Geologists in a contract with the USEPA and the USGS in the preparation of booklets and maps to be used by the EPA in preparing a radon potential map of the United States.

Charles Collnson sent large shipments of copies of historic and current bathymetric maps to Stanley Consultants, Chicago; Johnson, Johnson and Roy, Ann Arbor, Michigan, and Moffat and Nichol, Long Beach, California. All are working on the proposed restoration of the Chicago Harbor/Navy Pier area. At various times throughout the year, copies of maps, sidescan sonar records, oblique aerial photographs, historic maps and documents, boring and bottom-sampling records, and other materials were compiled and copied, or specifically plotted from digital files for organizations such as the U.S. Geological Survey; Illinois Department of Transportation; Kdrna and Associates, Inc., of Chicago; National Oceanic and Atmospheric Administration; Market Facts, Inc., under contract to the U.S. Army Corps of Engineers; Environmental Restoration Systems of East Chicago, Indiana; and various attorneys, real estate firms, and consultants seeking information about smaller portions of the lakeshore.

William S. Dey participated in a meeting with representatives of several local government agencies held in Kankakee, July 6, 1989, to discuss the pilot study on agricultural chemicals in rural private wells and to seek their help in implementing the study. In Effingham, on June 20, 1990, he also represented the ISGS at a meeting of a committee discussing ways to minimize the impacts of livestock wastes on groundwater.

Gary B. Dreher was invited to attend a meeting of the Field Sampling and Laboratory Analysis Team of the Mid-Continent Herbicide Initiative, Midwest Water Quality Initiative and MASTER Initiative at Arvada, Colorado, March 22-23, 1990.

Paul B. DuMontelle and Robert A. Bauer presented the Program Implementation Plan for the Illinois Mine Subsidence Research Program to the IMSRP Technical Advisory Panel at a meeting in Mt. Vernon, Illinois, February 15, 1990. The panel met in conjunction with a seminar on subsidence sponsored by the American Mining Congress.

J. James Eidel, James W. Baxter, and others in the Mineral Resources and Engineering Branch during the past year have reviewed and commented on various documents connected with the development and final implementation of the ten-year forest management plan for the Shawnee National Forest.

Ardith K. Hansel presented a discussion of the geology of a proposed sanitary landfill site for the Health and Agriculture Committee of the McHenry County Board at a meeting on January 8, 1990.

Paul C. Heigold, Timothy H. Larson, and Phillip G. Orozco discussed ISGS participation in exploration for shallow groundwater supplies in Hudson Township at a meeting for officials of the City of Bloomington, McLean County, and Hudson, Illinois.

Beverly L. Herzog is technical advisor for the Citizens' Advisory Committee on the Decommissioning of the Sheffield Low-Level Radioactive Waste Disposal Facility and attended evening meetings in Princeton on October 26, 1989, and in Sheffield on June 19, 1990. She met with the members of the McHenry County Board's Landfill Committee to discuss the possible role of the ISGS in providing technical assistance for siting a landfill. She also reviewed the geology of the various till units in the county.

Richard H. Howard provided technical advice on potential geological hazards posed by the leaking underground gas storage reservoir operated by Northern Illinois Gas Company at Ancona.

Bryan G. Huff compiled data for the Energy Information Administration of the U.S. Department of Energy regarding the quantity and value of natural gas produced in the state, and on the number of active oil and gas operators in the state.

John P. Kempton, Myrna M. Killey, E. Donald McKay, and C. Brian Trask made presentations at the stops and answered questions for participants from the Champaign County Intergovernmental Solid Waste Disposal Association (ISWDA) during a field excursion around central Champaign County. The field trip was to acquaint the members of the governmental body with the basics of the geology of the county so that they might better understand the geological factors that affect the suitability of a landfill site. They also made a presentation on Champaign County geology and non-GIS mapping procedures for the members of the ISWDA and their consultants on September 26, 1989.

Robert J. Krumm provided a copy of the LEGAL program and other information about the Illinois State Plane Coordinate system to aid the Illinois Criminal Justice Information Authority in converting cartographic information from one coordinate system to another. He also supplied information on the availability of digital data and applications of GIS to the Department of Earth Science and Geography of Southern Illinois University at Edwardsville. Tables of data converting section corners to state plane coordinates were supplied for the offices of the supervisors of assessment for Sangamon, Effingham, Pike, Christian, and Marion Counties. Information was supplied to Commonwealth Edison Company regarding the effect of the new North American Datum on traditional and computer-based mapping in Illinois. For the Illinois Geologic Mapping Advisory Committee meeting in Champaign, July 24, 1989, he presented a talk, "Geographic Information Systems for Processing Geologic Data."

E. Donald McKay presented talks and offered testimony on ISGS capabilities and services for landfill site screening for county boards or ad hoc landfill siting committees in Coles, Cook, Crawford, Lake, La Salle, Sangamon, and Vermilion Counties. At four public meetings of the Intergovernmental Solid Waste Disposal Association of Champaign County during fiscal year 1990, he provided progress reports and discussed results of the ISGS screening study for the county. He also reviewed research results and methods for the County's engineering consultants at their offices in Madison, Wisconsin.

Morris W. Leighton provided written testimony on geologic mapping in Illinois on behalf of the Survey at the Senate Hearing in Springfield on May 23, 1990. This was in support of Senate Resolution 881 sponsored by Senator Etheredge that calls for a report to the Senate on the status, needs, cost-benefits, and recommendations for geologic mapping in Illinois.

Morris W. Leighton, Donald F. Oltz, and John M. Lytle attended a Department of Energy (DOE) sponsored seminar on the federal/state cooperative program in fossil energy that was held in Chicago on May 2, 1990 and provided comments during break-out sessions on different aspects of this newly developing DOE initiative.

Dennis P. McKenna presented the talk, "Pilot Study: Agricultural Chemical in Rural Private Wells," for the Piatt County agricultural leaders group in Monticello, Illinois, February 26, 1990. At the meeting of the Interagency Coordinating Committee on Groundwater on January 9, 1990, he reviewed the findings and recommendations of the Initial report to the General Assembly on pesticide impacts on groundwater in Illinois.

Michael V. Miller visited sites and prepared written responses to requests for information from the U.S. Army Corps of Engineers and the Chicago Park District about various proposed courses of action surrounding a permit application by Chicago METRA to fill in a wetlands area near Beverly.

Donald F. Oltz prepared written comments on the U.S. Department of Energy Implementation Plan for Oil and Gas Research and coordinated a response from the three Illinois Basin States submitted February 8, 1990.

Samuel V. Panno presented information to the Logan County Board on October 6, 1989, about the local geology and the potential for contamination of aquifers by the proposed installation of a municipal sanitary landfill nearby.

Paul D. Terpstra, Michael J. Chrzastowski, and others from the ISGS met twice with staff of the Illinois Department of Conservation and consulting engineers at North Point Marina to review maps and plan emergency remedial actions to protect shore structures from rapidly advancing erosion.

Testimony/Information Provided for Civil/Criminal Court Proceedings

Robert A. Bauer presented testimony on December 8, 1989, as an expert witness on mine subsidence. The case involved the Illinois Department of Mines and Minerals, Shell Pipeline Company, and Old Ben Coal Company.

Keros Cartwright provided technical review of an out-of-court settlement of issues surrounding the closed Sheffield nuclear waste disposal site proposed by the Department of Nuclear Safety.

Michael J. Chrzastowski provided copies of sidescan sonar records bathymetric maps and a descriptive report to William Wood of the Department of Civil Engineering, Purdue University, an expert witness for the Chicago Park District, the defendant in a civil suit concerning an alleged injury to a swimmer. Similar information had been provided previously to lawyers for the plaintiff.

Charles Collinson provided an affidavit and a deposition for the legal firm of Joyce and Kubasiak, PC, of Chicago in connection with ongoing litigation over a shoreline property in Winnetka.

Bryan G. Huff appeared as an expert witness for the State in a criminal fraud complaint brought by the Commonwealth of Pennsylvania against an Irvine, California, firm that sold shares in Illinois oil wells. At the trial in Harrisburg, Pennsylvania, on March 27, 1990, he testified on oil well exploratory classifications, the general geology of oil fields in Illinois, permitting procedures in the State of Illinois, exploratory well success rates in the State and common oil well production rates.

Participation on Local/State/National Government Advisory Committees

Robert A. Bauer is a member of the Illinois Department of Transportation's Committee on Hazardous Waste. He also presented information on the impact of earthquakes on coal mine stability to Robert Bayless of the Legislative Research Unit in Springfield. For the Chicago Office of the Legislative Research Unit, he presented information on coal mine subsidence and lack of success in the use of blind backfilling in preventing unplanned subsidence in abandoned underground workings.

James W. Baxter served on the review panel for the U.S. Forest Service's new ten-year forest use plan for the Shawnee National Forest. He also provided a review for a permit to explore for kaolinite in the Shawnee National Forest for the U.S. Forest Service office in Harrisburg.

Richard C. Berg is an alternate representative for the ISGS on the Interagency Coordinating Committee on Groundwater. He and **John P. Kempton** also are members of the U.S. EPA Region V Mid-Continent Initiative Project Working Group. Richard Berg serves as a technical advisor to the Advisory and Evaluation Committee for Groundwater Protection of "Business and Professional People for the Public Interest," a civic organization in Chicago.

Richard A. Cahill serves as the facility coordinator for the ISGS for the Illinois Emergency Services and Disaster Agency under the SARA requirements.

Keros Cartwright is a member of the Science Advisory Board for the U.S. Environmental Protection Agency. He also serves on the Environmental Advisory Committee for the Savannah River Site for Westinghouse, the operator of the U.S. Department of Energy's Savannah River Plant. He serves on the Technical Advisory Committee On Low-Level Radioactive Waste Siting for the State of North Carolina. On October 23-26, 1989, He participated in the technical meetings of the International Joint Commission on the Great Lakes. He represents the ISGS on the Interagency Coordinating Committee on Groundwater.

Michael J. Chrzastowski assisted the Delaware Geological Survey and the Department of Geology at the University of Delaware in the refitting and sea trials of the coring barge R/V PHRYNE II during September 1990. The refitted barge, which Michael Chrzastowski had used for his dissertation research, will be used in a major offshore coring project to evaluate sand deposits for use in nourishment of Delaware beaches.

Charles Collinson chaired the Research Advisory Committee of the Illinois-Indiana Sea Grant Program during 1989-90 and is serving as a member of the committee for 1990-91. In the position of chair, he presided over regular committee meetings and a special workshop held in 1989, reviewed about 25 scientific proposals, attended the annual national review meeting, and prepared a summary of environmental priorities for the Illinois-Indiana Sea Grant program.

Helnz H. Damberger is a member of the Steering Committee for the Coal Reserves Assessment project of the Energy Information Administration of the U.S. Department of Energy and participated in a meeting of that committee at Washington, DC, December 5, 1989. He and **Colln G. Treworgy** participated in the Coal Reserves Assessment Conference sponsored by the EIA in Arlington, Virginia, February 7, 1990. At that meeting, Colin G. Treworgy presented the paper, "Using Company Reserve Estimates to Calibrate Government Reserve Base Estimates: A Test Case in the Illinois Basin."

Helnz H. Damberger, J. James Eidel, Paul B. DuMontelle, Jonathan H. Goodwin, John P. Kempton, Robert J. Krumm, and E. Donald McKay participated in the meetings of the Illinois Geological Mapping Advisory Committee and assisted the Chief in organizing and running the meetings of the IGMAC held July 24 and December 12, 1989, in Urbana, and May 3, 1990, in Springfield. **Morris W. Leighton** is secretary for the IGMAC.

Paul B. DuMontelle, Paul C. Heigold, and Robert A. Bauer represented Chief Morris W. Leighton at a number of the deliberations of the Risk Assessment Committee of the Governor's Earthquake Preparedness Task Force. They and others at ISGS prepared written and oral testimony for the Task Force and the Committee; participated in a public meeting at Carbondale, Illinois, on January 11, 1990,

to respond to questions and present factual information about seismic risk; wrote significant parts of drafts of the Task Force report to the governor; and assisted the staff of the Emergency Services and Disaster Agency in compiling and editing the final version of the report.

Paul B. DuMontelle participated as vice chair in all the meetings of the Illinois Mapping Advisory Committee and the Illinois Geological Mapping Advisory Committee during the year. He is president of the Boneyard Creek Commission for the City of Urbana and chaired monthly meetings of that advisory commission. He also served on the steering committee of the Champaign County Soil and Water Conservation District and worked to prepare the model stormwater drainage ordinance presented to the County Board in December 1989.

Leon R. Follmer participated in the annual planning conference of the Soil Conservation Service, held September 14, 1989.

Beverly L. Herzog represents the ISGS on the state's Inflow Stream Protection Committee and is preparing an issue paper on groundwater-surface water interactions for this committee. The Committee is to report to the General Assembly and the Governor in 1991. She also serves on the Groundwater Quantity Committee of the State Water Plan Task Force. **Beverly Herzog** and **Sam Panno** are members of the newly formed state Committee on Groundwater Monitoring Well Construction and, in that capacity, they will review proposed rules and regulations.

Robert J. Krumm and **E. Donald McKay** represent the ISGS on the Computerized River Information System Advisory Committee for the U.S. Fish and Wildlife Service and attended a meeting of that committee at LaCrosse, Wisconsin, October 10-11, 1989.

Morris W. Leighton serves as an Advisor on the Governor's Science Advisory Council and is a member of its subcommittees on Vision and on Infrastructure. He participated in the annual Executive Committee meeting of the Water Resources Center, University of Illinois, as a member of that committee, and in meetings of the Board of Natural Resources and Conservation and the Nature of Illinois Foundation (formerly the Society for Illinois Scientific Surveys). He also served on the Governor's Task Force for Earthquake Preparedness and assisted in scoping the efforts of its Committee on Risk Assessment. He served as a member of the Board of the Association for Research on Sulfur in Coal, an organization that advises the Center for Research on Sulfur in Coal on program direction. He and **Rodney R. Ruch**, CRSC Program Committee member, attended the annual Board Meeting in Bloomington, Illinois on August 17, 1989.

Morris W. Leighton and **Donald F. Oltz** organized and hosted the joint meeting of the Petroleum Advisory Committee and the Technical Advisory Committee of the state-federal cooperative program, "Research on Improved and Enhanced Oil Recovery in Illinois Through Reservoir Characterization," on March 1, 1990, at Champaign. **H. Wayne Bang**, **Andrew Finley**, **Bryan G. Huff**, **Randall E. Hughes**, **Hannes E. Leetaru**, **Beverly Seyler**, **Stephen T. Whitaker**, and **John D. Yeko** presented results of ongoing studies to the committees.

John M. Lytle is a member of the Technical Advisory Committee for the U.S. Department of Energy's Engineering Development of Advanced Physical Fine Coal Cleaning Technologies project.

E. Donald McKay represents the ISGS on the Interagency Steering Committee of the Illinois Geographic Information System (IGIS). He also serves on the database advisory panel of the Midcontinent Herbicide Initiative of the U.S. Geological Survey Water Resources Division.

Dennis P. McKenna is a member of the Technical Integration Group of the Midcontinent Herbicide Initiative, an oversight committee to coordinate federal research programs. He attended meetings of the Group on July 19-20, July 28, September 20, and November 28, 1989, and January 30 and March 28, 1990. He is a member of the Pesticide Subcommittee of the Illinois Interagency Coordinating Committee on Groundwater.

Edward Mehnert served on the Research Advisory Committee of the Hazardous Waste Research and Information Center until September 1, 1989.

Michael V. Miller serves on the State Watershed Priority Committee of the Illinois Department of Agriculture. He serves as an alternate for J. James Eidel on the Wetlands Advisory Committee of the Department of Conservation. He participates in meetings of the In-Stream Flow Protection Committee of the State Water Plan Task Force of the Illinois Department of Transportation, Division of Water Resources. He is a member of the Champaign Citizens Advisory Committee for Middle Fork Wetlands and Park siting.

Donald F. Oltz represented Chief Morris W. Leighton at three meetings of the Board of the Geoscience Research Institute for Improved Oil Recovery. He also organized and chaired a meeting of representatives of State Geological Surveys from the five nearby states to organize and coordinate a research project in reservoir classification as part of an effort sponsored by the Interstate Oil Compact Commission and the Geoscience Research Institute. He represented the ISGS at the annual meeting of the Interstate Oil Compact Commission in Tulsa, Oklahoma, December 3-6, 1989. He is a member of Energy Resources Committee and the Environmental Affairs Subcommittee of the Research Committee for the IOCC. For the National Institute for Petroleum and Energy Research (NIPER), he serves on the Technical Energy Production Research Committee and attended a meeting of that committee on February 7, 1990, in Dallas, Texas.

Christopher J. Stohr is secretary for the Illinois Mapping Advisory Committee and, in that position, helped to organize meetings of the committee held on September 8, 1989, April 27, 1990, and June 15, 1990. He also serves as alternate to Richard Dahlberg as liaison between the Illinois (topographic) Mapping Advisory Committee and the Illinois Geologic Mapping Advisory Committee.

C. Brian Trask is a member of the Citizens Environmental Advisory Commission of the Champaign City Council. The panel meets once each month and advises the City Council on environmental matters.

CONTRIBUTIONS TO THE PUBLIC AND INDUSTRY

Popularized Addresses/Presentations for Civic Groups/Public Meetings

Robert A. Bauer presented the talk, "Effects of Longwall Coal Mining on Aquifers and the Ground Surface," to more than 200 participants at an informational meeting in Carlinville, Illinois, sponsored by the Macoupin County Farm Bureau on May 15, 1990. He also discussed, "Environmental Property Assessment and Liability for Banking Institutions" at a meeting of the Midwest Bankers Association in Urbana, May 23, 1990. At the meeting of the Board of Directors of the Society for the Illinois Scientific Surveys, he and **Brenda Bouché Mehnert** presented an informational display about the Illinois Mine Subsidence Research Program.

James W. Baxter presented an illustrated talk on the geologic factors to be considered in planning an underground mining operation for the annual meeting of the Illinois Association of Aggregate Producers in Springfield, May 8, 1990. He also reviewed the many kinds of detailed information available from the ISGS for the group.

Subhash B. Bhagwat presented the talk, "World Energy Situation and How It Concerns Illinois," to a meeting of the Izaak Walton League at the Anita Purves Nature Center in Urbana, February 8, 1990.

Michael J. Chrzastowski presented a slide talk on the discovery of relict stumps on the bottom of southern Lake Michigan for the annual banquet of the Chicago Rock and Mineral Club on April 7, 1990. At the time the discovery was announced, he was interviewed approximately seven times for newspaper and radio.

Paul B. DuMontelle presented the talk, "Earthquakes in Illinois," for the State meeting of the American Red Cross held in Champaign in October and presented talks on earthquake preparedness in Illinois

for the C-U early risers Rotary Club, the Pana Rotary Club and the C-U noon Kiwanis Club during the spring.

J. James Eidel presented talks on his recent trip to Alaska for the Illinois Geological Society, Champaign County Audubon Society, the Sierra Club, and the Izaak Walton League. At each, he also discussed the impacts of the Alaskan oil spill and the need for exploration for mineral resources in Illinois.

Jonathan H. Goodwin, Rodney D. Norby, Leon R. Follmer, and Pamela K. Foster all devoted considerable time to designing several panels for the display on "Biodiversity of Illinois" sponsored by the Society for the Scientific Surveys. The display was mounted at offices of the Marine Bank in Springfield in October and in Champaign in November. It was also displayed in Decatur in the early spring.

Paul C. Heigold was called upon for numerous interviews for television, radio, and print media following the Loma Prieta, California, earthquake. In addition to all three local Champaign and Decatur television stations, he gave voice-over interviews for Chicago's Channel 11 and the ABC "Prime Time" news show out of New York. He was also interviewed by telephone by seven radio stations in the state, the Associated Press wire service, reporters from 11 newspapers across the state, and 1 from Minneapolis, Minnesota.

Myrna M. Killey and C. Brian Trask presented the talk, "Geology and the World's Brightest Light," for the Illinois Chapter of the International Right of Way Association at a meeting in Springfield, Illinois, February 22, 1990. They also led a "rock walk" for about 30 people for Middle Fork Appreciation Day at Kickapoo State Park in conjunction with Earth Day 1990. For a reporter from the Champaign-Urbana *News-Gazette* who called on April 4, 1990, they reviewed what would be seen on the walk.

Morris W. Leighton spoke on "The Illinois Basin—A World Class Interior Cratonic Basin" at the Prairie Gem and Geological Society meeting in Urbana on May 16, 1990.

E. Donald McKay presented the talk, "Siting Waste Disposal Facilities in Illinois with the Assistance of the Latest Computer Technology," for the Izaak Walton League in Urbana, Illinois, October 21, 1989. For the Society of Soil Conservationists, he presented "GIS Applications for Natural Resource Management" on February 21, 1990.

Dennis P. McKenna spoke on "Impacts of Agricultural Chemicals on Groundwater in Illinois" at the Illinois Farm Bureau Governmental Affairs Leadership Conference in Springfield, Illinois, February 26, 1990.

Donald G. Mikulic assisted Material Service Corporation in the development of exhibits on the geology of the Thornton Reef and the history of the Chicago stone industry for an open house at the quarry on September 9 attended by an estimated 10,000 people. He staffed the exhibits and answered questions from the public. He lectured on the history of Chicago's stone industry for the Chicago Section of the Society of Mining Engineers at Hinsdale, Illinois, February 6, 1990. On April 28, 1990, he led a field trip to the Thornton Quarry for the Chicago Academy of Sciences. He talked about the geology and paleontology of the Chicago region for the Chicago Gem and Mineral Society on May 26, 1990.

Donald F. Oltz was the invited speaker at the banquet for "Oil Appreciation Days" sponsored by the Mt. Carmel (Illinois) Chamber of Commerce, January 30, 1990. He spoke on "Research on Improved and Enhanced Oil Recovery in Illinois Through Reservoir Characterization." He was interviewed by a reporter from the Champaign-Urbana *News-Gazette* for a story about the ENR-DOE improved oil recovery project that appeared on February 18, 1990.

Michael L. Sargent spoke to the Illinois Dunesland Preservation Society on "The U.S. Geological Survey Number 1 Illinois Beach State Park Deep Drillhole: Purpose, Depth, Geology" at the Illinois Beach State Park Lodge, February 17, 1990.

Richard H. Shiley, Kristi K. Brewer, Lawrence Wu, Daniel J. Adomaitis, and Conrad Hinckley of SIU staffed a display about the carbon monoxide-ethanol coal desulfurization project at the Illinois State Fair, August 9-19, 1989, in Springfield, Illinois. The display was also set up for the National Corn Growers Association Corn Utilization Conference III, in St. Louis, Missouri, June 19, 1990.

Other Services to the Public

Terrie P. Adams, Richard A. Cahill, Philip J. DeMaris, Myrna M. Killey, Richard J. Rice, Michael L. Sargent, and Edward C. Smith served as science fair judges at various schools in the Chicago or Champaign-Urbana regions in January, February, and March.

Todd R. Black, an ISGS staff member pursuing an engineering degree, exhibited the earthquake simulator device at Newmark Laboratory at the University of Illinois during Engineering Open House, March 2-3, 1990. The device was used to demonstrate the relationships between the frequencies of earthquake waves and the natural resonating frequencies of structures. A news story about the demonstration was aired by WAND-TV on March 2.

Madalene R. T. Cartwright, Kathy L. Cooley, Jonathan H. Goodwin, and David L. Reinertsen staffed ENR's groundwater protection education booth in the agriculture tent at the Illinois State Fair.

Charles Collinson was interviewed in depth by the *Highland Park News* for an article on the decline of the lake level released in the fall of 1989.

William S. Dey gave a short progress report on the pilot study of agricultural chemicals in rural private water wells to a breakfast meeting of local government officials and representatives of the local farming community in Monticello, Illinois, on February 13, 1990.

J. James Eldel was interviewed on WILL radio about the Alaskan oil spill and about the need for mineral exploration in Illinois.

Myrna M. Killey provided assistance to the Director of the State Museum for Mineralogy and Geology in Dresden, East Germany, in obtaining a photograph of Lincoln's Tomb in Springfield, which is made, in part, from Zoebnitz Serpentinite. The request was relayed by the University of Notre Dame Department of Geology.

John M. Masters is judging chairman for the Earth Science Division of the Illinois Junior Academy of Science. **Phillip C. Reed and Jonathan H. Goodwin** coordinated the judging of science projects for the earth science division at the State Science Fair, May 17, 1990, in John M. Masters' absence. Judges for the state science fair included **Russell J. Jacobson, Myrna M. Killey, Nicholas P. Schneider, Edward C. Smith, Christopher J. Stohr, and Lawrence Wu.**

